

A Report to the University

Carleton University
1975-76

CP419

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CONTENTS

	Page
Report of the President	1
Honours and Distinctions	3
The Faculties: <i>Dean's Introduction, Programs and Policies, Teaching Methods, Students, Relations with the Community</i>	
Faculty of Arts	4
Faculty of Social Sciences	14
St. Patrick's College	27
Faculty of Science	30
Faculty of Engineering	39
Faculty of Graduate Studies and Research	48
Report of the Vice-President (Academic)	50
Report of the Vice-President (Administration)	56
Deans, Directors, and Chairmen 1975-76	58
Financial Statements Year Ended June 30, 1976	60
Student Enrolment Comparative Summary 1974-75 and 1975-76	63

A faint, sepia-toned background image of a classical building, possibly a temple or a government building, featuring four prominent columns and a triangular pediment. The image is out of focus, creating a watermark-like effect.

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Report of the President

Nationalism and Internationalism in Canadian Universities

During the late sixties and the early 1970s, Canadian universities began to be seen and to some extent to see themselves as units in provincial university systems. Organizations like the Council of Ontario Universities (COU), the Conference of Rectors and Principals of Quebec Universities, and the Association of Atlantic Universities gained in importance, and national groupings such as the Association of Universities and Colleges of Canada (AUCC) tended to play a secondary role in co-ordinating university life. Perhaps as a reaction against provincialization, the last few years, and particularly this current year, have been a reassertion of the national and international roles of the universities. Nationalism and internationalism are sometimes uneasy bedfellows and the conflict between the two new trends that were reasserted was particularly evident in Ontario.

In the spring of 1976 AUCC published the report of the Symons Commission, entitled *To Know Ourselves*, which had been in preparation for three years and had attracted an exceptionally large number of briefs and other communications. Professor T.H.B. Symons, the former president of Trent University, urged on universities the need to stress Canadian studies, to make sure that disciplinary courses had a full Canadian content, and to check whether the staffing of university departments was such that Canadians, or at least those who had an intimate knowledge of Canada, were in charge of the setting of curricula, the hiring of new staff, and the direction of research activity. The Symons Report attracted more media attention than any other AUCC report had ever received and became a topic of conversation far beyond the faculty clubs and student associations of the universities themselves. In Ontario, the minister of colleges and universities, Dr. Harry Parrott, took up the challenge of the Symons Report and drew attention in no uncertain way to what he felt was an excessive proportion of non-Canadian teachers in Canadian universities and a record of new hirings that gave little promise of a rectification of this situation. In letters to Ontario university presidents and a statement to the House, he called for action to increase the proportion of Canadians teaching in Ontario universities and implied that sanctions would be applied if change did not occur in a visible fashion by the fall of the year. An agreement was worked out between COU and the ministry whereby university presidents took personal responsibility for the hiring process, agreeing to ensure that full advertising containing all the essential information about vacant posts occur and that fair consideration be given to all Canadian applicants before new hirings took place.



A second action by Dr. Parrott did not have a basis within the Symons Report. He announced that the fees of new foreign students would be increased to \$750 per term beginning in September of 1976 for the colleges of applied arts and technology, and in January of 1977 for the universities. Certain exceptions were made for students who were studying in Canada under the auspices of the Canadian International Development Agency (CIDA) or who were otherwise sponsored by schemes designed to aid the development of Third World countries. The new Ontario policy would mean that fees for foreign students covered by the new policy would be tripled and that a substantial differentiation between the costs of university education for non-Canadians as opposed to Canadians would be established. In some other provinces, and particularly in Alberta, similar policies were aired by the provincial government although no specific action was taken.

The response of Ontario universities to the new hiring policy of the Ontario government took two major forms. First, the figures on Canadian citizenship of Ontario professors were verified and it was discovered that many persons who had formerly been citizens of another country had taken out Canadian citizenship without their records being changed. The revised figures on the percentage of non-Canadian teachers showed 71.7 percent in 1975-76 instead of the 66.5 percent in 1974-75 on which the minister had based his concern. Secondly, the distinction between professors who were landed immigrants already teaching in a Canadian university and those who took out landed immigrant papers simply to come to Canada to ac-

cept a teaching post was urged on the minister. The latter category, it was suggested, was the only one which mattered as far as the assurance of a commitment to Canada and the study of Canada was concerned.

Reaction to the fee increase for visa students took the form of questioning the reality of the problem which the increase in fees was intended to remedy. Several Ontario presidents, including myself, joined a task force of the Canadian Bureau of International Education which questioned sharply the principle of fee differentials and set out to gather more detailed information on the presence of foreign students in Canadian universities and on an analysis of their impact on university life. The costs of educating foreign students were compared to the benefits accruing to Canada from their presence and the government was urged to reconsider the fee increase policy.

Two other events of 1975-76 served to highlight the importance of the national aspect of Canadian university life. The decision of the federal government to freeze the amounts available through the National Research Council, the Medical Research Council, and Canada Council for the support of research in Canadian universities caused widespread concern, and AUCC, the Canadian Association of University Teachers (CAUT), and several other academic bodies made strong representations to the federal government to reverse its decision. It was pointed out that in a period of high inflation the freezing of funds meant a decline in support of major significance, not just for the present but for the future. The ability to keep research teams together and to plan research development was affected adversely by even a pause in research support. A partial restitution of funding for medical research was achieved.

Also in 1975-76 the federal government and the provinces prepared their positions for the renegotiation of the Fiscal Arrangements Act which determines the relative share of federal and provincial funding for the support of universities. AUCC presented a brief to the federal government and to the governments of each province calling for a retention of the federal government's role in financing higher education and the creation of a forum in which the universities could present their views to both the federal and provincial governments on the development of national policies for universities. The main proposal of the brief was that a radical departure from present funding schemes was undesirable until more clearly defined objectives for Canadian higher education could be worked out with a considerable input in policy discussion from the universities themselves. CAUT and other bodies similarly urged the need for a rethinking of policy before major funding changes were agreed to.

One of the major reasons for a continued federal role in Canadian university life cited in the AUCC brief was the need to strengthen the role of universities in international studies and the reinforcing of their contribution to international development. The feeling that the resource base within universities for contributions at the international level was inadequate received strong expression. The

beginnings of a remedy to this situation took the form of the Higher Education Co-operation Plan designed to stimulate research development in Third World countries through collaboration with Canadian universities. It was inaugurated through joint action by AUCC and CIDA.

Within Carleton itself, the year saw a strengthening of both the national and international roles of the university, with no conflict between these two aspects of university development being evident. Senate approved a new undergraduate program for St. Patrick's College in Canadian studies which should reinforce the emphasis on this field already well established by the Institute of Canadian Studies with its flourishing program of graduate studies and research. International studies, to which the university has a major commitment, were reinforced by the creation of the Paterson Centre, a unit of the university designed to foster research and studies over the whole range of international relations and development. The new centre has attracted the support of a strong advisory council on which several members of the Board of Governors are represented. The emergence of Carleton as a major Canadian centre for international studies is, of course, helped by our location in Ottawa, but much more importantly by the dedication of a strong group of scholars coming from several disciplines.

In response to the Symons Commission, Senate created a committee to look into our involvement in Canadian studies and into the adequacy of Canadian content in our courses. The committee presented an interim report and promises to provide further information and recommendations for the development of research and study on Canada.

The Carleton Year

The year saw a considerable increase in enrolment of graduate students bringing our total full-time graduate registration up to the 1,000 mark. The expansion of graduate studies is a sign of the maturity of Carleton University and attention will be focussed in future on the quality and range of our programs and of the research associated with them.

Senate also decided to separate the divisions of the Faculty of Arts into two independent but co-operating units: a faculty of social sciences and a faculty of arts. Dean Wendt of the former Division II became the dean of the Faculty of Social Sciences and the Faculty of Arts was led until the end of the year by Dean L.M. Read. The latter was replaced on July 1 by Dean James Downey. Registrarial services and other common facilities for the two faculties will be retained. At St. Patrick's College, Dean John O'Manique replaced Dean Hugh MacDougall. The new dean will be concerned immediately with the review of programs at the college and with plans for its future development.

M.K. Oliver

Honours and Distinctions

Honorary Degrees

Gerhard Herzberg, Chancellor (D.Sc., Western)
George Fierheller, Board of Governors (LL.D., Concordia)
Henry Mayo, Political Science (D.Litt., Memorial)
(Professor Emeritus, Carleton)

Royal Society of Canada Fellow

Gilles Paquet, Graduate Studies and Research
George Setterfield, Biology
Frank Vallee, Sociology and Anthropology

Entomological Society of Canada Fellow

H.H.J. Nesbitt, Biology

American Psychology Association Fellow

P.D. McCormack, Psychology

OCUFA Teaching Awards

J. Kenneth Torrance, Geography (for 1975)
C.S. Tsai, Chemistry (for 1976)
D.J. Wurtele, English (for 1976)

Order of St. John - Serving Brother

John Braaksma, Civil Engineering

American Society of International Law - Certificate of Merit

Allan Gotlieb, International Affairs
(co-author of best published work in the field of
international law for 1974-75)

Association of Universities and Colleges of Canada

M.K. Oliver, President (President of AUCC for 1976-77)

Canadian Association of University Teachers

Jill Vickers, Political Science (President of CAUT
for 1976-77)

Faculty of Arts

Dean's Introduction

On the face of it, the academic year 1975-76 would appear to have been another year of encircling gloom without much in the way of kindly-light leading. Nor was the anxiety without an efficient cause. Another year of retrenchment, combined with the problems that issued from the negotiating and implementing of a first collective agreement, took its toll on the already depleted resources of forebearance and trust. For the Faculty of Arts the most serious aspect of the past two years has been the loss from the full-time faculty of key personnel. The names themselves are eloquent description of the magnitude of the loss: Richard Glover, Fernand Ouellet, Marston LaFrance, Patrick Cruttwell, Eva Kushner, Wladimir Krynski, William Amtmann, Eleanor Swallow, and Mary-Louise Campbell. Others have gone as well, but the group named above were all senior people who occupied positions of strategic importance in their departments. No faculty can afford to lose so many senior scholars so quickly without feeling both its academic strength and its confidence shaken.

Yet, despite the retrenchment affecting staffing and budget, the faculty continued to take to heart the words of the author of Ecclesiastes "He that observeth the wind shall not sow; and he that regardeth the clouds shall not reap". Academic planning continued. A program of film studies was set in place and will begin enrolling students in 1976-77. Senate gave unanimous approval to the English department's proposal for a new Ph.D. program in Canadian literature.

Meanwhile, vines planted in previous years started to bear fruit. A pilot project for the teaching of French to faculty and support staff, and involving new methods of instruction, proved both popular and successful. Plans to extend our programs into the community got underway with the scheduling of four courses off-campus during the regular academic year and a fifth during the summer. The average enrolment in these courses was sixty-five. In 1976-77 the number of off-campus courses will be increased to eleven. The French department launched a new undergraduate program which places emphases on French linguistics and French-Canadian literature. And indeed in every department of the faculty, as the annual reports show, there was evidence of academic husbandry: courses and programs continually being examined and improved.

The year 1975-76 will also be remembered as the one in which Divisions I and II separated to become independent faculties. The association of humanities and social sciences within the same faculty had been mutually fructifying and remarkably amicable. The new Faculty of

Arts looks forward to creative academic architecture in the years ahead and extends a wish for the same to the new Faculty of Social Sciences.

James Downey

Programs and Policies

Art History

The department's 1975-76 enrolment figures bore witness to the increasing student interest in the course offerings and the majors and honours programs in art history. Course enrolments increased by 16 percent to 841 and some 155 students registered in the department's majors and honours programs.

Class sizes have naturally showed large increases, and with no substantial change in staffing these had to be absorbed by instructors. Such added burdens were felt at all levels with resultant pressures on quality and time. In some honours-level seminars there were over twenty students, a situation which invalidates the seminar as a method of teaching. It is a matter of concern in the department that while its student courses have doubled over the past four years its staffing arrangements have remained basically the same.

Demand for the department's graduate program has been increasing, but has had to be strictly controlled in consideration for the personnel from the National Gallery who provide most of the instruction.

The department's new undergraduate program, begun in 1975-76, is a long-term commitment; it has required some adjustment at most levels and some changes have been made, particularly at the fourth-year level for 1976-77, to broaden the range of offerings. The question of a new graduate program in art history has not been cleared up by the Advisory Committee on Academic Planning (ACAP) yet. The department's position is directly related to adequate staffing to carry graduate and undergraduate programs; both could not, in the present circumstances, be maintained adequately.

Classics

As in the past a great deal of the department's time was devoted to teaching. In 1975-76 overall enrolment increased by between 16 and 17 percent. Most of this increase is to be ascribed to the growing popularity of our classical civilization program. Enrolment in the first-year course, Classical Civilization 13.100, increased by almost 50 percent. A new course, Classical Civilization 13.235: *Ancient Science and Technology*, proved very popular and had a total enrolment of over seventy students. Enrolments in the languages Greek and Latin remained much as they have been in the past, that is, small but steady.

During 1975-76 the Arts Faculty Board and the Senate approved a number of new programs in classical civilization: a straight honours and a straight major in classical

civilization as well as combined honours and majors in classical civilization (ancient history), to be taken as part of a combined degree with history.

Co-operation with the Department of Classics at the University of Ottawa began in earnest this year. Both graduate and undergraduate students were sent there for courses and the department provided an external examiner for one of its M.A. candidates. In turn, the University of Ottawa sent undergraduate students to Carleton and the two departments also co-sponsored a guest lecturer.

At the undergraduate level the department hopes to continue to develop its classical civilization program. In 1976-77 the full major and honours programs in classical civilization will become operational. In order to provide as much variety as possible in our course offerings, some courses will be offered on a rota-system. At the graduate level and in the undergraduate language programs, we would like even more co-operation with the classics department at the University of Ottawa. Discussion will likely take place in the near future about integrating the graduate programs and the undergraduate language programs of the two departments.

In 1976-77 straight major and honours programs will be offered in classical civilization as well as combined major and honours (ancient history). Also, in 1976-77, off-campus courses will be mounted commencing with two half-courses programs in classical civilization to be taught in Rockcliffe: Classical Civilization 13.102* and 13.103*.

English

The department continued to devote about 80 percent of its time to teaching, 15 percent to research, and 5 percent to administration and community service.

In the area of program planning, should the proposal for Ph.D. in Canadian literature be approved by the province, considerable attention will have to be given in the next few years to the development of this program. However, the implementation of this program will be possible only if several replacement appointments are made in the near future in both Canadian and non-Canadian fields.

In response to a request from Senate that remedial instruction in English be offered to all first-year students who lack basic skills in writing, the department offered to expand its Writing Tutorial Service. An experimental testing program will probably be tried out in the autumn of 1976.

The department formally revised its core-course program, added to its honour program a required course in Canadian literature, and approved a combined honours program in English and journalism. St. Patrick's course offerings were rationalized and fully integrated into the department's array of courses. After two years of consideration by the Faculty of Graduate Studies and Research, the department's proposal for Ph.D. in Canadian Literature was passed by Senate and forwarded to the Council of Ontario Universities for external assessment.

French

The academic year 1975-76 differed from the preceding years essentially for two reasons. To begin with, the department implemented the first stage of its new program. As far as the literature requirement is concerned, students wishing to major or do honours work in French are now given a choice between three different courses, two in French, or in French-Canadian literature, whereas in the past they all had to take the same course covering the whole range of French literature. For the time being, however, it does not appear that this possibility has attracted more students than in the past; it has merely brought about a certain distribution, with a majority of students choosing to take modern French or French-Canadian literature, which is precisely what had been expected.

In addition, the department operated for the first time a language placement test involving some 1,400 students. The purpose of the test was to achieve more homogeneity in the various language courses offered, and to make sure that students would be placed according to their experience and ability, thus deriving the maximum profit from their classes. Since no placement test can be considered an infallible method for assessing a student's capabilities, individual instructors were encouraged to recommend course changes during the first two weeks of classes.

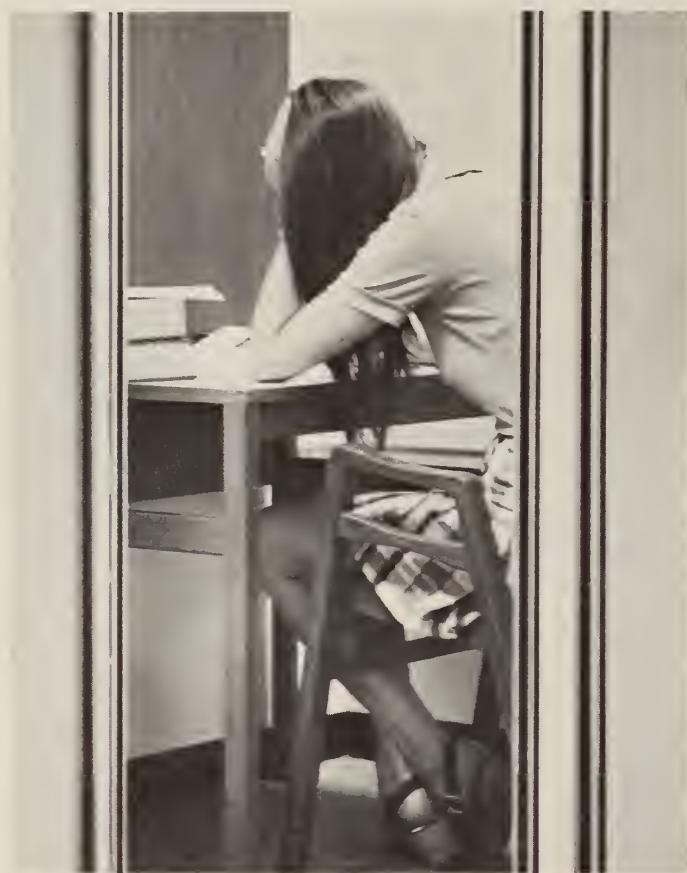
Two other important activities in which the department was involved, at least through some of its members, were the meetings of the Dean's Committee on the Language Learning Centre and the organization of a pilot project to language learning launched on the initiative of that committee. Members of the department on the Dean's Committee were fairly representative of views entertained in the department and, on the whole, they agreed with the dean of arts that further studies, financial and administrative, would be needed before any definite recommendation with regard to the desirability of setting up a language institute could be made.

In the spring of 1976 an exchange system paralleling the one that has existed since 1972 with the Centre Universitaire de Savoie, Chambéry, France, was set up with the Université du Québec à Trois-Rivières. Under an agreement negotiated jointly by the French and English departments with the support of the administration, three Carleton students will spend the coming academic year at Trois-Rivières, and three students from that university will spend the year at Carleton University.

Developments during the next four or so years will be closely linked with the success of the new program. If hopes materialize, this program should attract more students in the specific areas of linguistics (both theoretical and applied) and French-Canadian literature. However, at this point it is too early to say whether overall enrolment will go up.

The department is not, for the time being, considering any new undergraduate programs, since the one it

drew up in 1973-74 is only in the first stages of implementation. When the new program is completed in 1977-78, the department may want to restructure its M.A. courses so as to bring them in line with the rest of the program. Although so far no special program has been considered for part-time students, it is hoped that the first two off-campus courses to be given at Beacon Hill and Lisgar Collegiate during 1976-77 will help satisfy at least part of the demands of a wider public than that represented by the regular student body. If these two courses should prove successful, the department may want to consider the possibility of offering a greater variety of courses, also on a more advanced level, and perhaps further afield.



German

The 1975-76 academic year was marked with two sabbatical leaves, one for a full year and one for a half-year beginning January 1. The level of full-time replacement meant a reduction in the number of courses available to undergraduates, and also the entrusting of 2½ separate courses, which would in more normal years be the responsibility of full-time staff, to sessional lecturers. Neither of these steps was taken with any feeling of satisfaction. For the coming year it has at least been possible to put more courses in the hands of full-time person-

nel. It is clear also that a replacement, however competent a teacher and researcher, is not sufficiently cognisant of the administrative by-ways of the department, faculty, and university to bear a significant share of this side of the department's activities.

It is extremely difficult to comment in any positive fashion on the lines of development over the next four years, as the term normally implies a process of change which one is actively steering. Given the constantly diminishing budget of the department, the result of forces quite outside the department's control, there is developing a feeling that it is becoming increasingly difficult to exercise a satisfactory amount of control over the future. If a significant number of faculty should begin to have similar thoughts, the university will have a problem of morale, which could become acute.

History

The department experienced a relatively quiet year, although student enrolment was higher than ever before. It was encouragingly strong at the graduate level where, in addition to the usual complement of master's candidates, six new Ph.D. students were accepted, bringing the total number of doctoral candidates to ten. At the undergraduate level numbers remained firm especially in the upper years. Third year enrolment in particular again increased markedly and the honours program is still growing. The continuing interest in Canadian history so evident in recent years shows no sign of abating, quite the contrary, while the strong demand for Russian and North American history shows no sign of flagging either. The conversion of 24.014: *The Origins of North American Society* to a course for first-year as well as qualifying-year students increased its enrolment by over 200 percent.

Departmental plans for the next four years differ little from last year; their chances of fulfilment, however, have changed for the worse. The consolidation of the doctoral program and the institution of a combined master's degree in European history with the University of Ottawa remain the departmental goals at the graduate level. It remains to be seen what impact the recent changes in graduate financing will bring. Both recent and anticipated losses of faculty, as well as evidently changing patterns of student interest, will continue to require a thorough review and unavoidable alteration of undergraduate course offerings. Unfortunately, because of budgetary restrictions the department is unable to fill its vacant positions, which means that our hopes of moving into new and promising areas will have to be postponed once more, if not abandoned for the foreseeable future. Departmental plans for courses in Latin American and African history will be affected. The approval of a temporary position in Russian history, however, will permit the department to hold the line in Russian and Asian history.

Italian

There were no significant changes in or additions to the activities of the Department of Italian during 1975-76. The courses given in Italy during the summer, 1976, had the use of university facilities, that is, classrooms and libraries in Milan, Venice, and Florence.

The department's program will not be expanded during the next two years, although the 1975-76 enrolment increased significantly. The only possible program expansion would be from a combined honours into honours.



Linguistics

During the 1975-76 academic year the Department of Linguistics succeeded in having its previously drafted curriculum changes ratified by the various academic bodies. Plans for their implementation were then undertaken.

The policies and general lines of development, it was reported, will in all probability not undergo any significant change. Review of the new curriculum will, however, be made on an on-going basis and the necessary adjustments will be made.

The new programs are being considered and, while there is no limit on the number of students the department will accept, no special steps are taken to recruit students. The quality of students is reported to have remained the same as in previous years and as a result no changes have been made to the teaching methods employed in the department.

Two additions were made to the faculty, one a sessional lecturer appointment and one a full-time faculty transfer from the Spanish department.

Music

The year 1975-76 saw the beginnings of phase II of the long-term development of the Department of Music. The outline of our thinking in the annual report of 1974-75 has now realized concrete implementation (following the approval of Senate for a measure of practical music teaching and accreditation as an adjunct to musicological and compositional study) by the addition of half-courses of practical musical instruction for majors and honours only, and the appointment of part-time teachers in all those branches of performance for which there has been a demand.

Furthermore, the department completely remodelled its course structure and the requirements for degrees in music, thereby ensuring that students are more fully equipped for careers in music and/or entry to graduate schools. These alterations were presented to Senate and passed in the spring.

The following departmental activities of 1975-76 should also be noted:

1. An increase in enrolment over the previous years of 62.5 percent in the B.A. (music major) program and 71 percent in the B. Mus. (honours) program for a total increase of 66.2 percent
2. The establishment of our first off-campus introductory course at Sir Robert Borden High School with an enrolment in excess of 100 students
3. The appointment of a member of the National Museum of Man, Ethnological Division, as adjunct professor; the addition of this international scholar should increase the department's strength in the field of Canadian ethnomusicology, a field we have been developing in recent years
4. The continuing success of the choral group and orchestra, including a fine performance of Mozart's *Requiem Mass* in the spring
5. The establishment of a second series of noon-hour concerts at which members of the National Arts Centre Orchestra and others, including faculty and students, have performed regularly
6. The provision of an overseas residence summer course at the Royal School of Church Music, Addington Palace, England

The feeling of the department is that particular attention should be paid to the enormous impact that *musical performance* makes upon almost everyone, both inside and outside the university. For example, the inclusion of applied music in the department's program and the provision of practice rooms is of great significance when considering music's large enrolment increase. In addition, the university choir and orchestra, run by members of this department, are activities which take in students, faculty, administrators, librarians, and maintenance staff from all parts of Carleton; the noon-hour concerts, also run by this department, minister to people

throughout Carleton; and the musical performances, such as *The Beggars Opera*, bring great prestige on the whole university community. The department believes that this performance impact is in danger of being underrated in considering the work of the department, and that it is an area that, with good support, will produce highly satisfactory results in the future.

The department has submitted, therefore, that facilities for expansion in the field of musical performance should be part of future planning and that present facilities are quite inadequate if any growth is to be envisaged. The occasional use of Theatre A, Southam Hall, if booked sufficient months ahead, is not a substitute for a custom-designed *music* auditorium with normal adjustable acoustics and adequate rehearsal facilities. Studio A, in the music department, though excellent, can only hold an audience of around seventy, and far fewer if performers are more numerous. Also, Studio A is used for lectures, lecture/recitals, rehearsals, recitals, and recordings, which causes a great overloading of its facilities.

The department did not wish in any way to modify its basic view that applied music at Carleton be considered as an adjunct to theoretical and musicological study, but did urge that performance is one of the strongest cards it holds in the dissemination and adequate teaching of a wide and deep musical education. Future developments being considered are the expansion of (1) electronic composition and research; (2) Canadian music, both in historical and ethnomusicological areas; (3) performance opportunities for students.

Philosophy

As with most humanities departments, the major divergence from lines of development projected to the last annual report was the integration of the St. Patrick's College faculty and program into the department. Fortunately, the main lines of this integration had already been established as there had been a common Curriculum Committee for some years. The department feels now that the offerings at St. Patrick's are sufficiently distinctive, while remaining complementary to those on the Rideau River campus, and that they provide an excellent alternative undergraduate program in philosophy while preparing the student well for honours level and graduate work.

The department was gratified to have a noticeable increase in first-year registration, due largely to the re-establishment of two popular courses on the return from sabbatical leave of two of our members of faculty. At the graduate level, the tutorial program attracted as many students as the department feels it can handle.

A visiting professor of religion provided a good deal of intellectual stimulation, contributing actively to the life of this department as well as that of the Department of Religion. An exchange from Budapest was, unfortunately, not as fruitful as hoped; however, this first experience of the department in an exchange program should lead to further participation in such programs.



For the first time next year the department will be making an off-campus course offering. Further, two members of the department will, by invitation, be participating in the teaching of courses offered by other departments.

Because of the involvement of several members of the department in extra-departmental administration and teaching, as well as because of the policy of non-replacement of persons on leave and the loss of our sessional lecturership, the need had arisen to rotate a greater number of our course offerings in the next few years. Plans have been developed for doing this, as well as for integrating St. Patrick's College course offerings with those on the main campus. It is hoped, too, that rotation will permit the department to continue to introduce new course offerings, and especially ones of an interdisciplinary nature.

The Canadian Library of Philosophy project, in which several members of the department are involved in an editorial capacity, is expected to begin to issue publications in the next year or so.

Finally, the department also looks forward to a further increase in undergraduate enrolment in the coming year and to the successful completion of a record number of M.A. theses.

Religion

In last year's report the department announced that two of its principal objectives over the next few years were the revitalization of its undergraduate programs and the expansion of its M.A. programs. It was, therefore, satisfying that the department was able to report that in 1975-76 enrolment increased by approximately 22 percent from 726 to 884, the second-highest enrolment in the history of the department. The increase was most noticeable in two established courses (34.120 and 34.265) and in the new course, *Women in Religious Traditions* (34.201), which had an unexpectedly high enrolment. There is no indication that there will be a further increase in 1976-77. Enrolment in the graduate program was six part-time and four full-time students.

Origin and Early Development of Judaism and Christianity (34.120) was offered in Carleton Place during the summer with an enrolment of approximately 120. The same course will be offered downtown in the 1976-77 winter session. No special attempts have been made to recruit students. Summer evening programs contain basic introductory course and upper level courses in rotation, to ensure that part-time students have a reasonable number of options in completing their program.

Russian

The 1975-76 academic year was, partly as a consequence of the loss of one sessional lecturer and of the transformation of two other lecturers into instructors, a year of rationalization and consolidation for the Department of Russian. Despite the loss of a part-time member, however, the department taught, and hopes to continue to offer, no fewer courses than in the past. It was also a year of preparation for future change, less of substance than of emphasis.

The department intends to strengthen its major and honours program, which together comprise its academic core, in all ways possible. Recognizing, however, that present requirements of honours students are higher than in other language departments at the university, the department is planning to demand of such students not eleven courses as at present but ten. No reduction of total course offerings is envisaged, since to sustain an honours program in language and literature the department must allow students a certain measure of choice. At the same time, it is foreseen that service courses, aimed at students in other parts of the university and outside it, will grow more significant in the department's offerings—and to the department's welfare — over the coming four years.

Russian conversation half-courses 36.101* and 36.201* are to be made obligatory for all major and honours students, and will very probably be upgraded to 36.201* and 36.301*. It is also planned, if teaching staff can be found within the department to man such an additional course, to split *Russian for Scientists* (36.110) into two

courses. One course would be for natural scientists and engineers, the other for social scientists. *Studies in Russian Life and Culture* (36.360), in which many non-full-time students have been enrolling, is to be modified. It will not focus on a single work, as originally conceived, but on two or three.

Spanish

The most notable activity of the department in 1975-76 was the offering of an intensive Spanish program in Spain in conjunction with the Escuela Official de Idiomas. As described in last year's report, the program combined a first term of exclusive concentration on learning Spanish by students with little or no previous knowledge of the language, and a second term at the Universidad Autonoma de Barcelona in Spain. The first term, of course, was designed to promote acquisition of the language; the second, consolidation and expansion of linguistic skills.

Faced with declining enrolments, the department has made no decisions for development that would lead to expansion and its program is roughly the same as in the previous year. It is expected that this fall some restructuring of its program will be considered, to take more fully into account the needs and desires of today's students. This would probably not materialize as a proposal to the faculty for at least two years.

An undergraduate program in Latin American studies at St. Patrick's College is also under discussion by an ad hoc committee of the department.

School of Journalism

The policies governing the school's development outlined in last year's annual report were strengthened and improved during this past academic year. Of special importance was the launching of the master's program in which, for the first time, a full slate of courses was offered to a full class of graduate students. Eight students are currently writing theses and there is a good chance that three of them will be ready for graduation at fall convocation, 1976.

To encourage the growth of the master's program, the school admitted students to a qualifying year which corresponds roughly to the one-year undergraduate program. During the past academic semester three students were so registered. For 1976-77 twelve such students have been admitted in addition to the ten who will be fully registered as master's students.

The master's program is important not only because it is an opportunity for students to do advanced training with highly qualified professionals, but also because it further stimulates intensive analytical and research activities in the school. These activities are top priority on the school's agenda for reasons that have been discussed in earlier reports.

In line with such a priority, it may be noted that a grant of \$10,000 was awarded to the school by the Atkinson Foundation to help establish a journal of Canadian

journalism. In the short run, the journal will probably be published as "occasional papers" on an ad hoc basis. When funds allow for it, it is hoped that the journal will be the principal source of commentary and research in Canadian journalism. If there is a model for the development of such a journal, it lies somewhere between the *Columbia Journalism Review* and *Journalism Quarterly*. Of additional importance to the research and analytical achievements of the school was the publication of two books this year by members of faculty — *The Law and The Press in Canada* (McClelland and Stewart, Toronto, 1976) and *Journalism, Communication and The Law* (Prentice-Hall, Toronto, 1976), a reader which included original essays by several members of the department.

The undergraduate programs continued to develop. More students chose to take the combined honours programs that have been arranged during the last two years and two new ones have been entered in the calendar — journalism and English literature and journalism and psychology. As was reported last year, the department is making every attempt to encourage able students to undertake these combined programs not only because the combined training improves their prospects in the profession, but also because they allow for a more intensive intellectual experience in the university.

The job situation for graduating students is reported as being as good as it was last year with the regular group of managing editors and broadcast executives coming to the school to interview students.

Developments will continue along the lines of considering the establishment of a program in communication studies. The committee dealing with the subject is preparing to report to the departmental committee. If the program is approved at the departmental as well as the faculty and Senate levels, then the school could anticipate growth in the enrolment in non-professional courses, some of which are already being offered and some of which would have to be proposed along with the new program. The program could be offered to pass and honours students.

Institute of Canadian Studies

The Institute of Canadian Studies had the busiest year since it was established in 1957. A record total of eighty-eight graduate students in different categories were registered, thirty-seven of them in a full-time M.A. year. With the publication of nine additional titles, the Carleton Library became a series of 100 volumes.

The individual interdisciplinary programs developed by students included an extremely wide variety of areas, from aspects of contemporary northern life to nineteenth century literary and historical questions. Continuing a trend of the previous two years, an increasing proportion of admissions had strong backgrounds in the humanities, no doubt in part reflecting increased attention to Canadian literature and history in undergraduate university offerings. A sharp rise in applicants with strong academic

backgrounds of the kind required for the institute seemed to indicate a steadily growing interest in Canadian studies of an interdisciplinary nature.

The one course provided by the institute itself, the interdisciplinary seminar, grew to an awkward size. The problem was met in large part by dividing the class into two groups for most discussions. This arrangement was made possible by the co-operation of David Lewis, visiting fellow in the institute, and Anthony Westell, associate professor of journalism, both of whom took part in the seminar through the year. In the fall term the director of the Center for International Studies at Cornell University, who was a visiting research fellow, also joined the seminar.

With its hundredth volume the Carleton Library claimed its place as a major Canadian published series of broad value to university people and interested members of a wider public. It now includes a great range of works dealing with the history, society and institutions of Canada, many of them reprints of classic works, and also others, increasingly, that are originals. The series is published through an association with the Toronto publishing house of McClelland and Stewart, although all the editorial work is done at Carleton. As in all its work the institute must depend heavily on the help of people in other departments, as well as the collaboration of the faculty members on the editorial board who make the series possible.

At the end of the year there were indications of further pressure for the institute to grow as interest in Canadian subjects and in interdisciplinary approaches continues to increase. The ability of the institute to meet such pressures will depend on the sustained co-operation of other departments. So far all the necessary assistance and interest has been forthcoming generously, and signs for the future are good.

The major research project on the history of the CCF and NDP parties progressed well during the year, with the support of a substantial Canada Council grant.

Committee on Comparative Literature

Despite a limitation of faculty as a result of sabbatical leaves, members of the committee managed to offer a wide variety of courses to more than twice the number of full-time students than were offered in the previous year.

The 1975-76 academic year saw the creation of a Renaissance centre with the support of the dean of the Faculty of Graduate Studies and Research which resulted in several public lectures, including a symposium of Renaissance translation with a number of guest lecturers from other universities. Whether or not the centre continues under the auspices of comparative literature, it will be supported by comparative literature. It is hoped to incorporate one or more continuing research programs within the centre.

An ad hoc committee which included the dean of the

Faculty of Arts and involving the dean of Graduate Studies and Research decided that three independent assessments should be made of comparative literature (programs, instructors, calibre of students, viewpoints of students, library holdings, etc.). This process of internal assessment was based on the ACAP appraisals and was carried out by professors from the Universities of North Carolina, Alberta, and Queen's. Although two of the reports have now been received, no attempt has as yet been made to study them pending receipt of the third.

Comparative literature, which is a committee of the Faculty of Graduate Studies and Research, has at the present time a curious indeterminate status. It is expected that the internal assessment will serve as the basis for determining more precisely the role of comparative literature within the Faculty of Arts.

In terms of course offerings, the present commitment to the 500 level plus a few qualifying 400-level courses could extend downwards (undergraduate with more emphasis on theory, methodology, and problems of literature per se than is offered by the departments of national literatures).



Language Laboratories

Enrolment in language courses requiring use of laboratory space and equipment designed for individual private practice increased from 1,639 in 1974-75 to 1,880 in 1975-76. Total number of potential users in 1975-76 (including journalism students) was 2,130 compared to 1,922 in the preceding year. Nonetheless, a look at the graph showing a comparison between weekly attendance in the practice labs in 1974-75 and 1975-76 shows a drop in the number of users per week.

Higher enrolment in language courses, in particular in French, meant heavier demands of lab personnel. In fact, the amount of time required to produce teaching materials in the lab for language courses doubled over 1974-75. And, of course, the servicing of tape recorders used outside the labs occupied a large portion of the time of one technician.

Over the last few years there has been a significant change in language teaching methodology which is now making itself felt in the labs. As mentioned above, individual practice in the laboratories is not as heavily emphasized as it used to be. On the other hand, there is increasing use of audio-visual equipment in the language teaching classroom, and this has created a difficult situation in the language laboratory complex. A full report was sent to the dean. Briefly, however, it may be said that the need for well-equipped classrooms for language teaching purposes (classrooms which could be kept locked and whose scheduling would be handled by the language lab) has completely outstripped the availability of such rooms. Scheduling of language courses using A/V equipment has become a very difficult task. As mentioned in the report to the dean, the language laboratories would have needed thirteen classrooms to take care of requirements last year; they had five. Current language teaching theory suggests that the need will continue. It is hoped that a temporary solution will be found for 1976-77, but we will still be short of space, and there will still be language classes using improperly equipped rooms. Instructors will probably still need to carry A/V equipment to and from class, resulting in inconvenience and wasted time, and sometimes damage to equipment not designed for such use. Long-term planning in this area is urgently required.

Teaching Methods

Teaching methods within the faculty are, for the most part, traditional in nature. However, non-traditional methods have been undertaken for some time within the language departments where, as the language laboratory report suggests, there has been a shift in language teaching methodology from the behaviourist theory of language acquisition underlying the audio-lingual method to a cognitive or "mental" view which requires less drill (pattern practice) and less use of the practice labs.

In their attempts to provide effective language training,

the modern language departments must take into account the necessity to accommodate students from a wide range of backgrounds. To this end a number of different approaches to language instruction have been and are currently being explored. Use was made in the French department of *Dialogue Canada* for beginners' classes (one of which was reserved for faculty and support staff), and in the summer language course offered in Italy by the Italian department a new manual was utilized that had been designed to address the particular needs of the course. Another new manual prepared for Italian beginners by a member of the department is also being employed on an experimental basis and will be followed by one for intermediate Italian next year.

In other areas of the faculty increasing use of audio-visual aids is being made, and in the case of the Department of Classics a small film library is in the making as a result. The Department of History reported that, in addition to the use of audio-visual aids, some courses have replaced discussion groups with small tutorial groups, particularly where deficiencies in learning skills are apparent. Also, the Department of Music adopted a policy of rotating instructors in the first- and second-year courses so that both students and instructors avoid repetition and staleness.

Students

For almost all undergraduate departments in the faculty the recruitment of students has been greatly aided by the preparation of brochures. These profiles of departmental programs and activities have been produced in conjunction with the Information Office, Graphic Services, and the High School Liaison Office for circulation to secondary schools and for responses to individual requests for information. It is expected that during the 1976-77 academic year all departments will have their undergraduate programs brought to the attention of potential students via the wide distribution of these brochures. Plans for graduate brochures to supplement the poster information which is at present widely distributed by the departments are being considered.

In addition, certain departments emphasized personal contacts with other university departments in order to attract promising students. The music department also reported that a good relationship with the music and drama editors of the local newspapers results in regular news items about departmental activities. And as a result of some departments offering off-campus courses, many inquiries regarding other such off-campus course offerings have followed.

By far the majority of departments reported that enrolment limitations had not been required at either the undergraduate or the graduate level, the exceptions being classics (graduate), history (graduate), journalism (undergraduate), and music (undergraduate). However, a large number indicated that unless the resource picture

improved considerably, enrolment limitations seemed an inevitable next step.

The Departments of Classics and Music, together with the School of Journalism, were pleased to report that the calibre and attitude of their students was quite noteworthy. Journalism in particular observed that the morale of the school was quite high, largely as a result of the dedicated and hardworking group of students who in 1975-76 completed the one-year program. Throughout the remaining departments of the faculty there was reported considerable variation, with pockets of excellence being noted.

The French department also observed that a majority of graduate students preferred to earn their master's degrees by taking the required courses rather than by writing a master's thesis. However, the Committee on Comparative Literature reported that "many students would have wished to write a thesis but have not done so for financial reasons." The Spanish department also noted the frequency with which graduate students mentioned that their economic difficulties had increased greatly. The English department comments indicated that many of its potential graduate students had declined offers of admission to Carleton's graduate program for 1976 "in order to accept a larger amount of financial support elsewhere." As a consequence, it reported, that department's full-time graduate enrolment in 1976-77 is expected to be about 50 percent of 1975-76, an occurrence that the department linked with the fact that its level of funding fell well below the provincial average for graduate students in English.

The language departments of the faculty also seemed to present one common observation, namely, that students appear to be more fluent in spoken language but inadequately prepared to cope with written work. Ignorance of grammar was noted as a major cause for concern. The history department observed perhaps a more serious problem when it stated that "even more alarming than the lack of basic skills in syntax and grammar is the fact that some students seem to resent the fact that they should have to acquire such skills to pass such courses (and) that students seem now to expect that the normal grade is a B, rather than a C."

Community Relations

One of the traditional modes of community interaction in the arts is live theatre, in the form of plays, dramatic readings, and poetry readings. The Departments of Classics, English, German, and Spanish each sponsored or performed such activities and drew large audiences for the performances. *Yonder Lies the Valley*, an historical play dealing with the settlement of the Ottawa Valley, was produced by the Great Canadian Theatre Company, directed by a member of the English department, and involved the efforts of several other faculty members. The play toured Ottawa Valley towns with much success.

The Spanish Theatre Group from the University of Laval was invited to Carleton and staged two plays in the auditorium of St. Patrick's College, as did the Peter Arnott Marionette Theatre on an invitation from the classics department to perform Aristophanes' *The Birds* to an enthusiastic audience of almost 200.

A number of poetry readings occurred involving faculty members, either in the role of sponsor-producer or as author-reader. The German department, together with the Goethe Institute, sponsored a reading from Ingeborg Buchmann's poetry, performed by the German actress Marianne Hoppe. The English department hosted a number of readings given by poets sponsored by the League of Canadian Poets, as well as those by two well-known, visiting poets, Earle Birney and Daryl Hine.



And, as in previous years, theatrical productions funded by the President's Fine Arts Committee were co-ordinated by a member of the English department and staged both on campus and off. The major project of the co-ordinator's theatre year was the presentation of an original play about local history, Martin McCormack's *Tours of Duty*, which was directed by the co-ordinator. The co-ordinator worked with the author, a Carleton student, over several months preparing the script for the stage. Finally, in mid-January, it was presented for two afternoons as part of PM Theatre (an informal, noon-time vehicle for student skits and plays), and one evening. In addition, the play was taken off campus for presentation to the community at large. It was presented first at Glebe Community Centre where it was warmly received. Then the following night it was taken to South Carleton High School in Richmond. The audience there was particularly interested and appreciative because the play told a story that took place at a very early stage in that town's

history.

The modern language departments continued to interact with the Ottawa-area community by providing language courses for non-specialists, particularly in French. These courses were in great demand and it is perhaps worth noting that over the past few years senior citizens have been taking the courses in increasing numbers. In addition, these departments were sometimes called upon to provide translations for various individuals and organizations.

One of the roles performed by the language departments has traditionally been that of facilitating the flow of cultural and educational information from the various embassies to the Carleton community. To this end, the Spanish department's production and co-ordination of a Radio Carleton program, "Musica y dialogo", presented interviews with personalities and music from Spain, Latin America, Italy, and Brazil. Associations with cultural and educational societies were maintained and developed by departments in the faculty. Under the management of a member of the Spanish department, the Carleton-owned publication, *Revista canadiense de estudios hispanicos*, was in May, 1975, adopted as the official organ of the Canadian Association of Hispanists. A member of the Italian department served on a committee for a multiculturalism conference of multi-ethnic women, while another participated in the activities of the Dante Alighieri Society of Ottawa. And, as a matter of continued importance, departments engaged in activities connected with the necessary liaison with secondary school teachers' associations, regional associations, and the National Library Committee.

Faculty of Social Sciences

Dean's Introduction

A change in name, though scarcely in status, was approved for Division II of the Faculty of Arts by Senate and the Board of Governors. It is obviously still too early to speak of effects that nomenclature and a separate faculty board will have on our destinies. At the time of writing (twenty days after formal inception) there has been no substantial evidence of change. Thus, *mutatis mutandis* yields to plus ça change plus c'est la même chose.

The social science departments, schools, and institute continued to show genuine academic strength in the face of still increasing numbers of students. It has been particularly gratifying to observe the placement of the majority of our Ph.D. graduates in academic posts, while those graduating from master's programs continue to be recognized by a wide variety of employers as suitably educated.

The Norman Paterson Centre, which will be the focus for all international studies and exchange programs, was brought into being during the year. Its main component, the Norman Paterson School of International Affairs, demonstrated throughout the year its established maturity as a graduate school and its real impact on scholarly work in international affairs. The Institute of Soviet and East European Studies has not become a formal component of the centre, but it can be said that *detente dulcet* is the rule.

The School of Social Work was appraised for internal uses by consultants appointed from other universities. The experience was helpful in assisting the school in the preparation of new academic and administrative arrangements. It is expected that a significant number of the consultants' recommendations will be implemented during the forthcoming academic year.

The School of Commerce has had another year of increasing growth in student numbers, courses offered, and in instructional staff. The school has now taken responsibility for a range of courses in administration, finance, and marketing which were previously offered in the Department of Economics. This change has required more diversity in faculty specialization in the school. Work space, both in offices and lecture facilities, continued to be a critical factor in commerce. There are, as yet, no clear signs of decreasing student interest in this area of study.

The School of Public Administration has also been experiencing the mixed blessings of success. It is dubious whether further growth may be tolerated in view of limitations on full-time faculty, accommodation, and operating budget.

The Faculty of Social Sciences begins the 1976-77 academic year with new chairmen in all of its major departments but one, and new directors in public administration, international affairs and commerce have been



or will be appointed during the first term of this year. The retiring set of academic administrators have given strong and effective leadership. The quality of the new appointees is such that one may expect a continuance of sound academic activity and effective administration.

During the year the integration of teaching faculty previously designated as St. Patrick's College staff was fully accomplished in the Departments of Political Science, Economics, Psychology, and Sociology/Anthropology. Effective departmental control of the programs of the college now seems to be established. It is expected that this change will finally lead to an equitable distribution of effort as well as to a common quality of academic work on the two campuses, at least in the four disciplines involved. The major cost to the faculty is an increased liability in terms of required reductions in faculty members.

In the individual reports which follow, expression is given to the problems associated with implementing dynamic and popular programs within an essentially entrenched and inert system. I can do no better than to endorse the moderate and thoughtful statements of the chairmen and directors of the faculty.

R.A. Wendt

Programs and Policies

Economics

During 1975-76 the department concentrated on two, broad policy areas. The first is the honours program which was upgraded in quality with the removal of the third-class degree and the addition of two half-courses in theory at the senior level to fill what was perceived to be a vacuum after our second-year core. In addition, an increase in the entry requirements for senior-level honours courses is planned. These changes are consistent with the department's traditional concern for solid undergraduate training which has facilitated the placement of the department's better graduates in the best graduate schools on this continent and in the United Kingdom with accompanying substantial fellowship awards.

Secondly, planning of a Ph.D. program has taken a promising if complicated path. The department has decided to try to include the University of Ottawa within its "Economic Policy in Canada" framework. The strength of the University of Ottawa in the fields of international development and urban and regional economics will be combined with the four existing fields (industrial organization, public finance, money and trade, and urban and regional economics), while the resources of both departments should enable an improved capacity to offer courses in theory and quantitative methods. The administrative arrangements and program design are being worked out, and the plans will be submitted for appraisal in the near future.

Geography

Despite a tighter budget situation, and what many perceived as a less palatable climate in the university, the Department of Geography continued to offer an effective program. Indeed, improvements were engineered in both undergraduate and graduate instruction and an increased level of research and publication was attained during the year.

Undergraduate instruction continued to represent a heavy load on faculty in 1975-76. Modifications in the undergraduate program were initiated by the Curriculum Committee during the current year, with emphasis on second-year courses and the fourth year of the honours program. These changes include modularization in the introductory course (45.101) which was successfully introduced and favourably regarded by an increased student enrolment. The role of the introductory course has been clarified with different modules providing a base from which 200-level courses are developed. Completion of appropriate prerequisite modules aided some twenty-five students in placement in 200-level courses in this year of partial operation of the system. The scheme has been advertised through normal channels for the academic year 1976-77. Finally, an analysis of student questionnaires concerning the undergraduate program, distributed after spring final examination, 1976, considerably helped in a

program redesign beyond first year.

Modifications were also effected at the graduate level as the Graduate Studies Committee developed new procedures for M.A. applicant processing and selection and for M.A. advisory committees. Eleven new M.A. students were accepted during the 1975-76 academic year, making a total of twelve full-time and twenty-one part-time students. The increase in part-time M.A. students is in line with the Advisory Committee on Academic Planning (ACAP) recommendations for this department. Five graduate students were assisted by the Faculty of Graduate Studies and Research during the year with funds to attend conferences or symposia in Ontario that were relevant to their thesis research. Five M.A. degrees were completed in 1975-76, two of these assessed "with distinction".

In very general terms the department's discussions during the year led to an agreement in principle that members of the department would be prepared to give increased priority in research to the applied aspects of the discipline through a focus on development, with a particular emphasis on Canada and some Third World countries. The prime themes were identified as "Processes of Interdependent Development" and "Physical Processes in Environmental Management".

Greater utilization of our faculty, support staff, and resources for publication of material useful to the persons and institutions in the Eastern Ontario area remains an objective. After preliminary planning on an atlas of Eastern Ontario, it is expected that faculty will contribute themes and materials for preparation of text and plates.

Increased attention to field work and real-world learning experience is desired by most members of the department. It is planned to increase the range of the second-year field camp. Simulation and simulation games are likely to be used to an increased extent as part of this process. It is anticipated that any "challenge for credit" will come from the significant number of students involved in field work with various government agencies.

There is still the outstanding need to bring the department together physically, rather than spread over five floors and four towers of the Loeb Building. The present arrangements interfere seriously with the effective operation of the department and development of programs.

And, as recorded last year, improved communication, not only with high schools but also with the surrounding community in general, is an objective which it is expected will receive increased attention. The Department of Geography is still much too modest in relation to its resources and faculty capabilities.

No new undergraduate programs are being initiated currently. Rather, the current round of rationalization of our undergraduate programs should be completed. The Curriculum Committee should complete its present round of reviews by paying further attention to the third- and fourth-year course offerings on both the human and physical sides. This will involve some renumbering and regrouping of courses and should to some extent ease the

demands on faculty for undergraduate teaching. The major outstanding item requiring development is the field experience program.

Three major developments at the graduate level are significant. First, the adoption by members of the department of development as a major research focus, with "Canada-Third World Development Processes" and "Physical Constraints on Development" as major themes, will more readily reveal the applied aspect of our graduate instruction and research supervision. It will offer graduate students a focus that is not represented in other departments of geography in Ontario. Implications for changes in graduate course offerings are currently being considered by the departmental graduate committee. This should have the result of identifying more specific focus to the geography graduate program, particularly to thesis research, of which some 80 percent is of an applied nature. A part of this restructuring will involve the co-operative cartography project, including at least Carleton's emphasis on computer cartography. Coverage of remote sensing aspects has still to be resolved.

Second, completion of an M.A. degree by means other than thesis is under consideration by the departmental Graduate Studies Committee. Should there be a change in our present M.A. by research thesis only, this would make the M.A. much more feasible for part-time graduate students.

And third, discussion of Ph.D. programs is still under way and is tending not only toward a search for co-operative arrangements possible with Queen's and the University of Ottawa, but also toward one with other units at Carleton. This reflects continuance of some beneficial past experience and its prospective extension to other departments such as geology, civil engineering, economics, history, and sociology.

In general the department recognizes the need for the university and departments to provide more flexible opportunity for part-time students, and in general would be in support of any arrangements to provide a more flexible arrangement of course and program opportunities for these students. However, there is a cost involved, and it is difficult for a department on its own to provide such opportunity unless the university is prepared to encourage and support this financially. There is significant interest in developing non-formal, off-campus undergraduate course work based on the self-instruction modules developed by the 101 group.

Law

Interest in the study of law at the undergraduate level continues to grow with an increase of over 27 percent in the number of students taking a single course in law. The number of combined honours and majors in law and another discipline also continues to grow. This year at Spring Convocation there were fifty-three such students graduated, including seven from St. Patrick's College.

During 1975-76 the department continued to develop

close ties with the Law Reform Commission of Canada, both through the Jurisprudence Centre and employment of members of the commission as sessional lecturers.

The interdisciplinary nature of the department's program was increasingly emphasized. A faculty member participated in the Technology, Society and Environment project and several courses and seminars at the graduate level will be continued for students in the School of Public Administration and School of International Affairs. There is an increasing demand from the School of Commerce and Faculty of Engineering for courses in the commercial law area. Enrolment in Law 51.220: *Commercial Law* rose to 550 in 1975-76 with the great majority of students coming from the School of Commerce.

The department has developed a half-course, *Legal Aspects of Sport*, which was inaugurated during the summer session, 1976. Two other courses which have not been given for a couple of years for various reasons are being reactivated in 1976-77 — *Law and Native Peoples of Canada* and *Women and the Legal Process*. The three courses just mentioned, although not primarily established for part-time students, will be heavily subscribed by them.

The course 51.201: *Elements of Law* was redesigned in 1975-76 especially for high school teachers engaged in teaching law. This was well received and will be continued both in the fall-winter and summer sessions. A new course, 51.322: *International Economic Law I*, is planned for 1976-77. This course is designed primarily for students in commerce, economics, and international affairs.

While the department is loath to restrict undergraduate enrolment in view of the ever increasing demand for exposure to legal studies, this may soon be necessary if no increase in full-time faculty is permitted. With the increase in enrolment in 1975-76, the department is close to the limit of its resources and future increases in enrolment can only result in larger classes and seminars with decreasing quality in the services rendered. In addition, the situation is likely to deteriorate as a result of restrictions in the collective agreement on the hiring of sessional lecturers. This is particularly serious in the case of the law department which in the past has had to rely heavily on the services of sessionals.

The size of the department's honours program must be based on the size of our full-time faculty. No immediate restrictions are foreseen. With the present full-time faculty we should be able to supervise up to approximately fifty honours research essays in any one year.

There were five regular meetings of the Jurisprudence Centre this year at which the following were discussed: (1) the National Council of Churches conference on alternatives to incarceration, held in Boston, Massachusetts; (2) the problems of evaluating the criminal justice system; (3) the ordinary person in the legal process; (4) the concept of legal need; and (5) Robert M. Pirsig's book *Zen and the Art of Motorcycle Maintenance: an inquiry into values*.

With respect to its plans for research, the department is in a good position to conduct advanced research in the

following areas: (1) the teaching of law in secondary schools and to the layman; (2) law, social policy, and philosophy with emphasis on change and law reform; (3) administrative and legislative problems and international affairs.



Political Science

In contrast with the 1974-75 academic year, the enrolment figures for 1975-76 indicated a shift in the department's students from major to honours programs and a decline in the number of part-time students. Major students in political science totalled 128 full-time and 57 part-time; combined majors 81 full-time and 50 part-time; and combined honours 77 full-time and 13 part-time. There were in addition 16 full-time and 4 part-time major students located at the St. Patrick's College campus, as well as 14 full-time and 2 part-time combined majors, and 4 full-time and 2 part-time combined honours. At the graduate level the department registered 42 Ph.D. students, 33 M.A. (with 7 enrolled in the qualifying year), and 38 part-time students (12 Ph.D., 25 M.A., and 1 qualifying year).

The department's faculty members numbered forty-one with nine on sabbatical or leave of absence. The department's ability to utilize all of the faculty in its own teaching programs is limited by the involvement of a number of them in the programs of the university's various schools and institutes. Several members of the department assumed notable offices during the year, two being elected president of national organizations, and a third being named professor emeritus and also being granted an honorary degree.

One public lecture, "The Class Question and the National Question: Where Do They Intersect?", was sponsored by the department in February, with a member of the Department of Economics, University of Manitoba, and a member of the Department of Economics, McGill University, as participants. The Occasional Papers series published paper number 4, "The 1974 Federal Election: A Preliminary Report", in the fall of 1975.

The department is not considering new programs at the

undergraduate or graduate level, but several new courses were introduced (and others dropped) in developing core courses at the fifth-year level for the Ph.D. program. The policy of rotating third- and fourth-year courses between day and evening divisions has been continued to assist undergraduate students to complete degree work on a part-time basis.

There is no specific limit on the number of undergraduate students, although in some cases individual courses may have limited enrolment. Students whose past record would seem to preclude the successful completion of an honours essay have been discouraged from continuing in honours; a study of the completion rate of honours essays showed that for the period 1972-73 to the fall of 1975 only one-half of the students registered in the honours essay had completed the work. The grade point average for those who had not completed the course was 7.0 or below in political science.

Each year the Graduate Studies Committee of the department decides the quota for admissions in the following year. This quota is based on the existing level of supervision responsibility in the department and the rule applied is that the department will admit only that number of well-qualified students for whom adequate supervision can be provided. After a rapid expansion in the late sixties and the early seventies, the department now aims at a steady-state system of twenty-five new full-time M.A. students each year and ten Ph.D. students. A study of statistics over time shows a 55 percent rate completion for M.A.'s and 30-40 percent completion rate for Ph.D. students.

As the department has become better known, the number of well-qualified applicants for graduate studies has increased substantially. As a result it has been possible to raise the standards for admission to levels which are probably the highest in the country in political science. Precise data are difficult to come by, and this conclusion was reached only after the department had compared its admissions decisions with political science departments of other Ontario universities. Data released by ACAP in 1974-75 showed that Carleton's political science department was alone in admitting only those students with first-class standing to its Ph.D. program. For the past three years this rule has been adhered to, and for 1976-77 the department has been able to limit acceptances to the M.A. program to only those students with B+ scholastic indices or higher.

There has also been a steady increase in the number of Canada Council Fellowships and Ontario Graduate Scholarships. Next year the department will have six Canada Council holders among the Ph.D. students, its highest number to date. More than half of the Ph.D. students are funded from outside agencies. The doctoral students have also demonstrated a strong professional orientation, and the Carleton students have dominated the graduate student panels each year at the annual meetings of the Canadian Political Science Association. Joint faculty-student publications have also increased.

A certain slowing-up in the rate of completion of degrees occurred this year. The general state of the job market outside the university may be the principal cause, but the increasing, competing demands on faculty contact time may also be relevant. Given the high quality of the graduate program, the pressure on faculty for increased undergraduate course loads at the expense of graduate supervision constitutes a serious misappropriation of resources which the department feels must be corrected before it begins to damage the graduate program.

Graduate admissions were affected this year by the amount of support that could be provided by the university. The department increased the proportion of its contribution to teaching assistantships, but with a larger number of continuing Ph.D. students to support, firm rules had to be applied. No Ph.D. student beyond the third year was offered a teaching assistantship, although this was viewed as a possible constraint on their ability to continue, particularly for those students who are on student visas and are unable to find alternative employment. Even with this rule designed to allow sufficient funds for incoming students, there were still a number of well-qualified M.A. and Ph.D. students to whom the department was unable to make teaching assistantship offers. In at least one case, that student was lost for admission as a result. More may be lost by September.

Psychology

The department continued its overall examination of the undergraduate program which began last year. The primary function of the examination was to establish a series of educational priorities and responsibilities and then, if necessary, to modify the curriculum to meet these criteria. In general the department feels that it has a definite academic responsibility to provide both a general educational curriculum which will attract students who are not psychology majors and, at the same time, provide the type of educational opportunities which will be of benefit to psychology majors and honours students. It is felt that because of the large number of students with whom the department must deal, individual students, particularly in the pass program, have not been able to receive the personal attention that students have been given in other areas of the university. There appears to be a reluctance to initiate any new program which will increase the number of students the department has to serve before it is satisfied that it is providing a relatively high quality education for those students who are already enrolled in psychology. Most new programs which may be developed will be designed to serve the needs of existing students better and probably will be of an applied nature. Here many of the interests of the members of St. Patrick's campus dovetail with those on the main campus.

The integration of the programs in psychology offered at St. Patrick's College presented numerous problems for the department, as did the reformulating of descriptions of teaching duties associated with the 49.100 courses and

the reclassification of these positions from demonstrator to instructor.

The 1975-76 budget permitted the department to continue much in the same way as it operated in the past. The major effect of the budget, as well as the general financial status of the university, was to decrease the motivation for planning and developing new programs which could lead to expansion and to increase the desire to seek better ways to serve the students who are currently taking psychology courses. It is hoped that in the future there will be developed a type of incentive program to encourage departments which already have a large course load to provide still more programs which will attract students but which will directly benefit the individual department as well as the rest of the university.

Sociology/Anthropology

At the undergraduate level, having adopted a considerable number of course changes and some alterations in program the previous year, the department made very few changes. Two new half-courses on the native people of North America were added. When combined with the redesign of an existing fourth-year course in the same general area, these produced a net addition of one half-course. The decision also to continue for another year the two, "open-slot" half-courses on the North added substantial strength to the department's offerings on North America and, more especially, Canada, particularly from an anthropological standpoint.

Again at the undergraduate level, the department gave lengthy and serious consideration to its program at St. Patrick's College. As a result of these discussions, at least for the time being, the department has decided to retain a separate major in sociology at the college rather than assimilate it into the main campus sociology/anthropology model; to leave attached to that major its distinctive set of core and required courses with the understanding that it would be unlikely that all would be offered in any given year; to retain the college program's orientation towards application and policy; and to facilitate integration by offering at the college whenever possible and necessary a certain number of courses and sections within main-campus programs.

Still another development at the undergraduate level was the attempt to ensure a more probable and an earlier completion of the honours degree. Specifically, students in their third year in honours sociology, who intend to enroll in 53.495 (the honours practicum, as compared with 53.498, the independent honours essay), were invited to meet with the Honours Committee in early spring, and to continue to do so informally throughout the summer in the hope that this might help them to get well into their projects before the beginning of their final year. If this proves successful, it may be extended to the similar practicum in anthropology, and perhaps to the independent essay as well.

Probably more notable than these decisions by the department were those made by the students themselves. The

previous year had been marked by a levelling off in the decline of first-year enrolments which the department had been experiencing since the excessively sharp increases of the late sixties. In 1975-76 these began to move up again, by approximately 12 percent. In addition, the parallel decline in upper-year course enrolments and in degree-program registrations was succeeded by an increase during the year of perhaps 10 percent. This increase resulted in a corresponding increase in the average faculty workload and course sections which were already too large became even larger. And to round out the picture at this point, it should be noted that between 1974-75 and 1975-76 the number of graduate students (in all programs and at all levels, including qualifying year) increased by roughly 25 percent in both the full-time and part-time categories.

The principal new development at this level was the actual introduction of the M.A. program in Social Anthropology which had been favourably appraised and authorized for funding the year before. With a small number of students, as planned for the initial years of the program, only a few of the formally designated seminars were required. Nevertheless, it very soon became clear that the addition of another program had introduced one more dimension of demand on the department and its staff and resources. The program itself will undoubtedly require early re-examination, if only because of the lapse of several years between initial formulation and current implementation, but that should probably sensibly be postponed for a year or two.

For 1976-77 the graduate programs in sociology have been strengthened through several course additions, principally in methods and statistics and in the choice of topics for two of the open-slots reserved for new and special interests, as well as through the decision to offer a somewhat larger number and array of courses in order to provide students with a more varied selection.

Two further developments have particular application to the graduate program. The first of these was the agreement in principle to consider favourably suitable proposals for internship programs, particularly at one or another level of government, from graduate students who may be interested and to allow a limited amount of course credit for such undertakings. The second was the continuing attempt to maintain a successful colloquium program.

The upswing in the level of research activity within the department that had been noted in previous reports continued to make itself visible. One major collaborative project, which is expected to result in a census monograph, was added to the list and, while the output of papers and publications for the year was not unusually strong, several major projects and a number of others are expected to reach completion and perhaps to be brought to publication within the next year or so. On a related point, during the year or shortly thereafter four members of the department completed their dissertations and received their Ph.D. degrees.

Several members of the department received special honours or took on new assignments in the course of the year. Chief among these was the election of a second mem-

ber of the department to membership in the Royal Society of Canada.

Another member was invited to establish a new department of sociology at the University of Tasmania, while others were involved in various capacities with university administration.

It seems most unlikely that the department will wish to or be able to undertake any new programs within the next few years. Its policies and general lines of development, as has been suggested earlier, will concern themselves with the graduate programs and the integration of St. Patrick's College faculty and disciplinary programs.

The newly instituted M.A. program in Social Anthropology will need to be subjected to careful monitoring and early review and, in particular, the department will want to have a close look at the role and substance of the courses that are designated as required in the program, the two fields of area specialization that are built into the program, the opportunities for field work, and the willingness and ability of the staff to meet the demands of the new program.

The graduate program in sociology poses somewhat different problems. These include, particularly at the Ph.D. level, the need for more careful and effective co-ordination of the decentralized faculty committee system through which the student does much of his/her work and the need to increase the number of faculty who are principal participants in the program, without necessarily reducing the overall faculty commitment to undergraduate programs. And, in addition, throughout the graduate program both the rate and the pace of completion will require closer attention than they have perhaps received in the past.

More generally, while the department's several undergraduate programs are likely to remain largely intact, some of their components will require re-examination and, possibly, change. Two examples are the first two courses that all main-campus students are required to take regardless of program, that is, 56.100, because its sections continue to be larger than can be justified on pedagogical grounds, and 56.200, because of its special requirements in terms of class size and course substance and format. Both of these not only demand a heavier contribution of faculty resources, but represent a particularly crucial test of the department's commitment to the "fusion" of its two disciplines.

Beyond these two examples, although new fields and interests are most likely to be brought into the program via open-slot courses and tutorials, the whole array of courses is in need of systematic and detailed re-examination. In this exercise, rationalization and the reduction of overlap and duplication would be secondary to a clarification of course and program objectives and of the relation of "core" (required) and "fused" (in one of several senses, common to sociology and anthropology) courses to the rest.

On the occasion of the recent departmental review, as well as in earlier annual reports, the department described

some of its efforts to meet the needs of part-time students, for example, through extensive offerings, some repeated annually and others regularly rotated, in both the evening and the summer programs. In addition, the department has discussed on occasion the possibility of an alternative major program which, while not intended specifically or exclusively for part-time students, may be expected to be especially attuned to their interests and needs. While these discussions have yet to produce any decisions, the department has assigned to one of its members the task of exploring possible initiatives in respect to off-campus and extension work. Similarly, in the departmental review it endorsed a more extensive program of off-campus offerings and a more active pursuit of the needs and opportunities for continuing education in the several senses of that term. However, it also urged that these undertakings should be recognized as supplementary to current programs for part-time students, as requiring additional resources, and as most appropriately carried on by established departments and divisions.

School of Commerce

The level of activity in the School of Commerce rose markedly in 1975-76 and the demand on teaching resources increased in a variety of ways. Enrolment in commerce continued to grow, although at a more moderate rate of 18.5 percent (62.2 student courses) in 1975-76.

Demand within the commerce program was accentuated by the rising popularity of commerce courses in non-commerce areas. The pressures of outside demand were noticeable chiefly in accounting (where two-thirds of the registration at the introductory level is now non-commerce), but all introductory commerce courses were significantly affected.

Staff additions in the areas of accounting, finance, and marketing served to relieve the pressure of chronic understaffing in the school to some degree but, unfortunately, demand continues to outstrip available resources.

A continuing program of consolidation and improvement in the commerce program should begin to bear tangible fruit in 1976-77 and ensuing years. Additions to staff in finance, marketing, and policy will enable us to strengthen the program in these areas. Indeed, an expanded program in marketing is now in place and will be fully implemented in the coming year. An offering in this area, designed for and offered to students in the School of Industrial Design, will be given a trial in the coming year. The school will also offer courses in finance to public administration students for the first time in 1976-77. The demand for such interdepartmental services is strong and expansion will occur as resources become available.

In co-operation with the Department of Systems Engineering and Computing Science of the Faculty of Engineering, the program in data processing in commerce has been redesigned to add flexibility and depth. The new program will be implemented in the coming year despite a staffing shortage.

The areas of organizational behaviour and quantitative methods are also under review. Staffing needs in the behaviour area are critical, however, and must receive top priority so that much needed improvements can be made. The Long-Range Planning Committee is currently studying the question of priorities and strategies for the school. In particular, attention is being directed to the question of graduate studies in management.

The school is continuing its consideration of an M.B.A. program at Carleton. An informal proposal for a certificate in business program is under consideration as well. Present plans would suggest that such a program, carrying credits toward the Bachelor of Commerce degree and offered initially to part-time students, perhaps at off-campus locations, would integrate well with the expanded program in continuing education now under consideration by the university.

The trend to ever larger classes in commerce courses continued in 1975-76. Growing enrolment coupled with a small full-time faculty and a severely constrained budget for sessional lecturers has made this trend inevitable. Plans for 1976-77 have necessarily encompassed the need to co-ordinate enrolment with available teaching and support resources.



School of Public Administration

The 1975-76 year was the fourth year of operation of the school's graduate programs following the major changes made in 1972-73. Seven Diploma in Public Administration students and twenty-nine M.A. students graduated from the programs in June, 1976.

Full-time enrolments in 1975-76 reached the numbers originally envisaged in 1972, namely, 45 students in the first year and 45 students in the second year. This compared with 20 and 25 in the previous year. Increased enrolments were also evident in the part-time enrolment where 80 new students were admitted (total about 200). The agreement reached between Carleton and the University of Ottawa on the joint graduate program in Public Policy and Management was implemented in 1975-76. Finally, for 1976-77 we have now admitted 50 M.A. I, 40 M.A. II, and 25 mid-career, full-time students and 30 new part-time students.

In 1975-76 the school had a core of staff members covering the principal core disciplines. The six, full-time core staff members were augmented by faculty from other departments, although the rate of turnover of such staff continues to be a problem in that certain courses are staffed by different people every year.

On the research front, faculty members were involved in research funded by the Canada Council, the Economic Council of Canada, the Science Council, the Conference Board of Canada, and the Law Reform Commission. Work was also completed on the first phase of the development of a case research program funded by the Public Service Commission and involving the Department of Regional Economic Expansion.

The doubling of enrolment in 1975-76 meant that the school had to increase its staff to handle the new enrolment and to consolidate the program. With only one new appointment approved during the past year, staffing is still inadequate, particularly in the areas of accounting and finance, and will continue in 1976-77 to be dependent on a disproportionately high ratio of sessional staff to full-time staff. Because of the need for more sections of our core courses and the offering of new courses approved in conjunction with the mid-career program, the school will need additional appointments in 1976-77 in the areas of accounting and finance, quantitative analysis, policy analysis, public sector management, and economics.

The school views the projected 1976-77 full-time enrolment of 50 M.A. I, 50 M.A. II, and 25 mid-career students and 200 part-time students to be the optimum enrolment which we should seek to consolidate over the next two or three years. Within the mid-career group it is hoped that the school will achieve a position within two or three years where half of the students come from provincial and urban governments and half come from the federal government.

Those involved in the school are of the view that a moderately sized program is an essential requirement if we are to meet the following essential features of the program: (1) to permit faculty members and students from

different disciplines to interact in a meaningful way; (2) to enable the delivery of the program in seminar-sized classes; and (3) to achieve a genuine balance between administrative studies and public policy analysis.

School of Social Work

The past year has been extremely demanding for all members of the School of Social Work. Student enrolment was the highest it has ever been — 120 full-time graduate students, 25 part-time.

A great amount of effort has been expended on further clarification of the school's objectives and on revisions to the graduate program. Opinions have been sought from many individuals and organizations: there have been several working meetings with students and faculty, with professionals in the field, with social work agencies (both private and public), with social work educators in Canada, and with related areas of the university.

In the spring of 1976 there was a detailed review of the Master of Social Work program by two outside appraisers. It is hoped that as a result of this intensive curriculum research, the revised M.S.W. program should be fully operational by September, 1977, and will serve to strengthen the growing reputation of Carleton's School of Social Work as a source of competent, effective and challenging social workers.

Faculty have continued to produce a relatively large volume of research, and the Centre for Social Welfare Studies (see last year's report) had several new research projects awarded during the past academic year. However, the centre would make a greater contribution to research in the school (both student and faculty) if it were physically located in the same space.

A visiting professor from the Department of Social Administration, University of Bristol, was resident at the school from January to June, 1976. Students and faculty, particularly those interested in social administration and policy, benefited greatly from his knowledge of and experience in the British social service field. This comparative aspect of social service design and delivery added significantly to our own courses in social policy, particularly health care and program evaluation. He also worked on curriculum development and on the outline for a new course on personal social services. In the coming year the school has again been awarded a visiting professorship by Health and Welfare Canada. A member of the faculty of the University of Warwick will be on campus for the winter term.

The two-year grant from Health and Welfare Canada in support of the school's extension education program ended in June, 1976. In general, staff have been satisfied with community response to the program, although disappointed that the financial cutbacks suffered by social work agencies have meant less money available for further education. The program went out to different communities in Eastern Ontario, and it was found that this mobility was appreciated by professionals and interested individuals who have felt neglected by post-secondary institutions.

The provision of some courses and workshops in French was also popular. The school is now involved in an evaluation of the project, but will continue to offer a more modest extension education program in 1976-77.

In evaluating and rationalizing its present program, the school has identified several curricular areas which are being inadequately dealt with at present. New courses are, therefore, being developed in — personal social services, comparative studies of intervention, evaluation of programs involving social services, major courses in the history and philosophy of social welfare, and in "human behaviour and structural context of social work".

Three reviews of the school's program were anticipated during the year. Two of them have not taken place; the Board of Accreditation of the Canadian Schools of Social Work will probably send a team to the school during the coming year, and the ACAP review of social work programs across the province has not as yet been activated.

The internal review report reflected the general situation summarized above and recognized the solid thrust in a new direction for the school emphasizing the development of analytic qualities and the general sense of dynamic change. The main body of the report, as expected, detailed the many areas in which further revision, rationalization, and integration appeared necessary to outside observers. The key comment had to do with the degree to which the program actually translated into action the purposes of the school.

The report of the reviewers and the experience of the review helped sharpen the issues of concern for the faculty. Work is proceeding on a tight time schedule to rationalize and revise our present curriculum along the general lines indicated by the reviewers.

During the past year it became obvious that the school's first priority must be the completion of the revised M.S.W. program. The B.S.W. question will now be pursued more energetically during the coming year.

As outlined elsewhere, part-time enrolment continued to grow, although at a slower rate than the school and its prospective part-time student body would like. Again, the problem of resources is fundamental to the nature of the current part-time program. No special courses are offered for these students and they must accommodate themselves to the normal timetable.

Throughout the 1975-76 year the school felt constrained by its own budget, and also the financial position of the university. Three, full-time members of faculty were on leave for the academic year, which imposed a heavy burden on the remaining teaching staff. As a result of being unable to hire new staff, both full-time and part-time enrolment has been limited for September, 1976. And, unless the situation changes, it is unlikely that the school can continue to admit part-time students for at least two years. Faculty consultation visits to students on field placement have also been drastically cut, sometimes to an unsatisfactory level.

The Norman Paterson School of International Affairs

While the development of the Norman Paterson School of International Affairs during the academic year 1975-76 continued along previously established lines, the school attempted to develop an academic philosophy which would serve as a guide to policy decisions for the future and help determine how the school could offer an excellent junior graduate program. To this end the Academic Planning Committee of the school drew up a draft document which the Faculty Council considered in open meeting. The principles of the draft document were adopted, faculty and students were invited to make written submissions, and a revised draft will be considered in the fall. This process demonstrated that there is a broad consensus that the thrust of the school should remain academic and scholarly, although there were some differences of opinion as to what the implications of such a philosophy might be. These involved the question of balance between academic pursuits and scholarly research on the one hand, and professional training on the other. It is essential that the school enunciate, in order to plan for the 1977-78 academic year, its academic philosophy and present it to prospective students and faculty as a statement of the intellectual environment in which they will find themselves. This endeavour is regarded as of crucial importance.

Two major conferences were held at the school during this academic year. The first, held jointly with Cornell University's Centre for International Studies, discussed the question of North American energy policies. The second conference considered the role of the provinces in Canadian foreign policy. The school also played host to the Governing Council of the International Studies Association and continued to develop its relations with other institutions in North America, Europe, the Caribbean, and the Middle East.

The school attempted as well to provide opportunities for student field research and for work experience through a system of internships, to the limit of its financial capacities. Field work, for example, was provided mainly through summer travel grants. In addition, briefings were arranged in Washington for students of strategic studies and conflict analysis and a field trip was held in Trinidad for students of development. In turn, the school played host to the faculty and students of the Institute of International Relations of the University of the West Indies campus at Trinidad in June, 1976.

The former secretary-general of the Commonwealth joined the faculty as the first holder of the Lester B. Pearson Chair in International Affairs and began to play an active role in the life of the school. Two, new half-courses were instituted during this academic year both of which reflect an increased concern with international economic matters. A course in international monetary institutions and a course in East-West trade were offered. The research and publication activities of the school, if anything, were

expanded. However, the executive committee, reflecting the established publication policy, decided to suspend the Occasional Papers and the Current Comment series. This decision reflected a concern to invest in a more substantial monograph series which will be launched in the fall.

Institute of Soviet and East European Studies

The year under review constituted a difficult and uncertain period for the institute. In connection with plans to create a new centre for international studies, the institute's programs were submitted to extensive scrutiny and discussion. In the end, with near unanimity on the part of students and faculty, the institute decided that it could administer its programs more effectively on an autonomous basis. It, therefore, opted not to join the centre at this time.

At the beginning of the period under review, the administration of certain activities of the institute was divided among several departments of the university. In particular, administration of the graduate program was shifted to the School of International Affairs; administration of the Soviet and Hungarian academic exchange programs was shifted to the incipient centre; and administration of the undergraduate honours program was shifted to the Department of Russian. However, by the end of the period, all of these responsibilities with one exception had been shifted back to the institute. As of this writing, both the graduate and undergraduate programs are administered by the institute, while the exchange programs remain the primary responsibility of the centre. The director of the institute administers the graduate program; a specially designated honours supervisor handles the undergraduate program. Small advisory committees assist both administrators.

Despite these organizational changes and the attendant uncertainties, the activities traditionally associated with the institute continued at the level planned for the year. The institute's activities fall into three categories: teaching, research and publications, and special seminars and lectures.

The institute offers the only interdisciplinary M.A. program in Soviet and East European Studies in Canada, together with a strong preparatory undergraduate honours curriculum leading to it. The rapid expansion in Canadian political and economic relations with the USSR and Eastern Europe in the past five years has dramatically increased the need for young Canadians trained in the languages and cultures of the area. The awakened interest of Canadian government and business in the Soviet Union and Eastern Europe has begun to generate a response among students, and demand for the institute's academic programs has strengthened. At the same time the institute's research, publications, and visiting speaker programs have attracted widespread interest.

The steady curtailment of the institute's budget, in nominal and real terms over the past four years, precludes expansion of the academic programs of the institute. Therefore, the policy over the next few years is to main-

tain enrolment at its present levels of approximately twelve students entering the fourth year of the honours program, and about six students entering the regular M.A. year of the graduate program annually. Since student demand is in excess of available academic resources, we are seeking to raise the quality of incoming students and to speed their progress through the curriculum.

The institute's research and publications programs are financed by outside funds, as is a portion of our visiting speaker series. The plan is to seek to maintain the level of activity and funding in the research areas of East-West relations and nationality and minority problems. The freeze on academic staff makes it impossible to expand these activities, although we have sought and shall continue to seek external financing for visiting scholars who may contribute to both research and teaching.

Budget cuts have eliminated the part-time administrative assistant in the institute and reduced funds available for all support functions. As a result, we have stopped publication of the institute's newsletter, curtailed the public lectures series, and reduced by half the number of subscriptions in the institute's reading-room. The manifold demands on the reduced staff (currently one full-time secretary and a director with a two-course plus teaching load) necessarily curtail the time and energies available for long-term planning and development, fund raising, and student recruitment.



Teaching Methods

In a number of disciplines in the faculty, teaching methods at the undergraduate level in particular were constrained by the problems of large class size. Seminars in senior courses tended to lose vitality in groups of 35 to 45 students and lecture courses in turn were hard pressed to facilitate any sense of involvement with classes in excess of 100 students.

Nevertheless, a variety of teaching approaches were utilized, some of which were undertaken to combat the above-mentioned problems. These include: self-paced modularization in the Departments of Psychology and Economics; the use of case material and simulations in the Department of Political Science and the Schools of Commerce and Public Administration; the use of tutorial assistance outside of class hours in the areas of accounting and data processing; and, finally, the opportunity in the Department of Sociology/Anthropology for undergraduate students to undertake "course-related tutorials" for a half-course credit which permit students to work on their own or in close contact with an instructor (and/or a small set of peers) on questions which have attracted and interested them during a formally constituted course but which were not able to be pursued fully within the course.



In general, most departments made a conscious effort to give their senior graduate students the opportunity to participate actively in the undergraduate teaching program. The customary use of such students for instructional purposes is in the role of teaching assistantships, and in some cases the assignment of teaching assistants to selected modules allowed the department to provide the graduate students with the opportunity to obtain teaching experience in their own areas of specialization without having them be responsible for an entire course. This method also has the further advantage of determining the degree to which these students would be appropriate as sessional lecturers.

The School of Commerce added that on occasion it finds that a sessional lecturer, acquired for professional expertise and experience, may be technically classified as a graduate student as a result of his/her involvement in part-time studies.

The Department of Law found that it was necessary to utilize twenty-two students from the University of Ottawa as teaching assistants; however, the majority of them had been undergraduate students in law at Carleton.

Finally, there is some feeling in the faculty that while the new promotion guidelines did appear to recognize and reward effective effort and merit in the teaching role, this does not seem to have been achieved in practice. The additional point was expressed that there is little point in departmental chairmen encouraging faculty to devote much of their time and energy to instructional development when the promotional stakes use different hurdles.

Students

The recruitment efforts in the Faculty of Social Sciences take on many forms depending on the size of the undergraduate or graduate component of the departmental programs. Generally, at the undergraduate level most departments reported that no special steps were taken to recruit students. In fact, the psychology department cited as the cause for the lack of recruitment efforts serious reservations about whether it has been and will be able to provide a reasonable education for the large number of students in psychology.

However, the School of Commerce indicated that it was actively engaged in a public relations program, primarily to clarify the role of the school in the eyes of both secondary school students and their counsellors. It is hoped that the end result of this initiative will be reflected in the attraction of still higher quality students rather than the attraction of more numbers. The law department also reported that posters and pamphlets had been prepared describing the activities of the department and these were distributed to Ontario and Western Quebec secondary schools. The Department of Political Science said it was co-operating in the production of a brochure for undergraduate students in the series prepared for the High School Liaison Office.

At the graduate level the practices of preparing posters and pamphlets of the sort described above, as well as the publication of newsletters, was widespread throughout the faculty. In addition, some departments noted that efforts to respond to all inquiries promptly and personally had been rewarded and commented upon favourably by the better applicants. Most departments also relied upon the process of having the supervisor of graduate studies and/or individual faculty members contact their colleagues in search of able equipment.

The one other special recruitment program carried on within the faculty was the Native Student Recruitment program conducted by the School of Social Work. The 1975-



76 academic year was the first year of this program's implementation and it was made possible by the provision of financial assistance from the Donner Foundation. Under these arrangements four students were admitted, two of whom did not possess formal academic requirements; three have been admitted for September, 1976. While certain special problems were experienced by these students so that they required more consultation and supervision, their presence and active participation contributed to the program. An evaluation of the native student program cannot be made until some students graduate, but it is now evident that knowledge of its existence is spreading and response is generally favourable.

Decisions on the part of the departments/schools to limit enrolment were taken more often at the graduate level than the undergraduate, largely for reasons having to do with either ACAP recommendations, faculty resources for thesis supervisors, or limited physical facilities. However, two responses are of particular interest in respect to their undergraduate situation. The Department of Sociology/Anthropology reported that the question of growth had been pursued at length in the academic departmental review, and the principal features of the department's

view were that as a matter of social and academic policy it is in favour of open access to the university, the faculty, and the department in first-year courses and in major programs. However, the department also feels that such growth should be relatively slow and that it must be accompanied by a roughly comparable increase in the level of resources. This concern, with particular respect to the major programs, it was stated, had been occasioned by the necessity of minimizing present faculty dislocations and future redundancy. The response went on to say that, at the honours and graduate level, limited growth is desirable because of the department's need to achieve a better balanced distribution of students and programs, a more viable M.A. program in Anthropology, a larger pool of qualified eligibles for recruitment to the Ph.D. level in sociology, and, finally, the support of programs of somewhat enlarged range and diversity of offerings.

In much more particular terms, the School of Commerce reported that consideration was being given to the limitation of enrolment in senior courses to include only commerce students and those non-commerce students actively engaged in a program formally encompassing a minor in business. The view of the school is that by consciously limiting access to commerce courses for non-commerce students, resources may be redirected to the support of a commerce program servicing some 25 percent more commerce students. The methods of limitation were stated as being: (1) the use of sequential prerequisites, (2) minimum grade requirements, (3) quota systems, and (4) selection on the basis of academic performance in prerequisite courses. Individual course limits, the report stated, will be established to relate effective class size with available teaching resources.

In offering a general commentary on the students served by the departmental programs, one department observed that its students were characterized by conservatism, a greater concern for grades, and job-oriented motivation as reflected in their programs and course selection. Most other departments, however, reported that student interest in departmental activities outside the strict boundaries of curriculum had increased markedly and that this *esprit de corps* was gratifying. As a particular case in point, the School of Social Work reported that its students had planned and organized a fall conference on "Challenging Social Work", whose leadership was drawn largely from twenty innovative or radical social projects which the students had identified across Canada and whose attendance was equally diverse and geographically spread.

Along similarly positive lines the psychology department reported that in recent years there has been an increasing trend toward attracting better students and that this year the number of papers and published reports suggested that the students were more active in research than in previous years. The department accounted for this increased research activity by citing the assistance given by the graduate office in the form of stipends and scholarships, a fact which decreases the necessity for some stu-

dents to secure part-time employment and increases the time they have available for research activities.

The political science department reported a substantial increase in the number of well-qualified applicants for graduate studies. However, the economics department expressed distress over its anticipated difficulty in competing for the best graduate students, stating that other Ontario universities had managed to bid away several of the very superior applicants the department had admitted. Economics remarks concluded with a statement of the urgent necessity for external financing to be directed towards improving the department's competitive position.

Other departments expressed similar feelings about the lack of a competitive voice in attracting top quality students and, generally, the assistantship support for graduate students as well as study space was considered to be woefully inadequate. The School of Social Work indicated that financial support is so lacking that considerable importance has been given to summer jobs by students, with the result that an unusually large number of students had opted to do their field placements during the spring and summer term — an occurrence that taxed resources to the limit.

The concern over the lack of resources and space gave rise to statements by the departments and schools urging that planning in this respect be instituted, on other than an annual basis, as a priority.

Relations with the Community

The departments of the Faculty of Social Sciences maintained a wide variety of undertakings which actively engaged them in community activities. These efforts were concentrated in the three general areas of: (1) programs designed to answer an identifiable social need; (2) research projects aimed at addressing particular community problems; and (3) the more general but valuable and immediate contact with community associations that is maintained and encouraged by the many public lectures, seminars, and conferences presented by the various departments.

The Departments of Law and Psychology, as well as the Schools of Commerce, Public Administration, and Social Work, attempted by means of their program structure to respond to both the demands and the needs of the community in their maintenance and further development of such courses/programs as: *The Elements of Law*, a course surveying the Canadian legal system, its concepts, institution, processes, and function, designed particularly for teachers of law in secondary schools; *Behaviour Modification in Education*, a third-year psychology course and a program of community psychology organized and conducted by the members of the department located at St. Patrick's College (which involves, among other things, a series of practicum courses at various institutions such as the Detoxification Centre and the Rideau Correctional Centre); a business advisory program; and, finally, a mid-career program.

Community response to such courses/programs has been very gratifying as was witnessed by the involvement of some sixty local businesses in the Business Advisory Program which in 1975-76 was in its third year of operation under the sponsorship of the Ontario Ministry of Industry and Tourism.

The publication of a brochure, *Action for Children*, a pamphlet providing information on local treatment facilities for children with learning disabilities, resulted from the grants and consultative services of the Department of Psychology and responded to a long-felt need in the Ottawa area. Matching funds were also obtained from Central Mortgage and Housing Corporation to enable the Ottawa Family Service Centre to begin a feasibility study on the employment of tenant counsellors in the Bellevue Manor Housing Development. Similarly, the Department of Geography's master's students focused their research efforts on the local problems of open space planning and population growth trends in Ottawa, with both theses having been singled out by local newspapers for coverage.

The Department of Law also co-operated in the publication of a law journal for high school students. This experimental project was made possible through a grant from the Faculty of Graduate Studies and Research and had the support of the Department of Justice, the Ontario Ministry of Education, and the Law Reform Commission of Canada. The editor is a graduate student in the Institute of Canadian Studies and the first edition has been planned for September, 1976.

Three faculty members of the Department of Political Science were engaged in special studies for the Ottawa-Carleton Review of Regional Government, for the Royal Commission on Violence in the Communications Industry, and for the Royal Commission on Corporate Concentration. In addition, others participated in television and radio programs and one member of faculty gave a course, *China Today*, in the extension program of the university.

The majority of the departments offered extensive programs of seminars, workshops, lectures, and conferences open to all members of the community and designed to stimulate discussion of issues of interest to the community at large. The Institute of Soviet and East European Studies and the Norman Paterson School of International Affairs maintained their very valuable relations with the diplomatic community in the nation's capital as well as with the federal Departments of External Affairs, Industry, Trade and Commerce, and Defence, not to mention the members of the business community including the Canadian and International Chambers of Commerce and Canadian Manufacturer's Association.

Members of the Faculty of Social Sciences also served on innumerable community group committees ranging from the Lebreton Flats Citizens Committee to the board of the Rape Crisis Centre.

St. Patrick's College

Program and Policies

In April and May of 1975 major decisions on the status of St. Patrick's College were made by Senate. These were reported in the 1974-75 annual report but, because of their significance in all policy and planning at the college, should be repeated briefly here.

It was decided that college programs will be multidisciplinary, and will be developed at the college with the appropriate consultation with other sectors of the university and approved by the College Council for presentation to Senate. Disciplinary programs at the college will, on the other hand, be the responsibilities of the departments.

To facilitate these decisions on the academic program, the faculty of the college were integrated into the departments and procedures for assignment of faculty to teaching and administrative duties at the college were defined.

Most of the faculty assigned to the college for teaching and administrative duties for 1975-76 were those who were at the college prior to faculty integration with the departments, and so there was little evidence of major change in the classrooms or corridors. Nevertheless, it was a year of transition and, as such, for the most part a successful year. The experience of the year has indicated some areas within the integration procedures which need clarification, and it is expected that during the next few years, with appropriate clarification and further experience, the basic integration policy will prove to be good for the college and the university.

During the year the undergraduate major program in Canadian studies was approved by Senate for introduction in September, 1976. The program was planned by a committee with broad representation from throughout the (then) Faculty of Arts, and can indeed be considered to be the university program in Canadian studies at the undergraduate level. The program will begin with two streams — a humanities stream focusing on literature and history, and a social science stream with emphasis on political science, economics, and sociology. The program is highly structured and both streams have a French-language requirement. A third stream in urban-regional studies is being planned; this stream is more specialized and job-oriented, and the possibility of it becoming a multidisciplinary honours program is being considered. At the year's end, a feasibility study into a Canadian studies summer institute was begun with support from the Department of the Secretary of State. The report will be presented to the Canadian Studies Committee and to the Senate Committee on Continuing Education.

A second multidisciplinary major program, in criminology and corrections, is now being planned. This is a

development from a course of studies that the college has had for some years, and from work in this field that members of faculty in psychology and sociology have been engaged in. It is expected that a proposal will be ready for College Council and Senate during 1976-77.

The Dean's Humanities Program Committee has recently been formed to look into and make proposals on this area of the college program. The committee has been asked specifically to consider the possibilities of a more structural program including a common first year, the role of the United Liberal Arts Program (ULAP) and of the general B.A., and the inclusion of language requirements.

To attempt to give the first-year student and, in general, the undeclared major better academic counselling, the position of co-ordinator of counselling for undeclared majors has been created along with a committee of six counsellors which, with the co-ordinator, will be responsible for the development of counselling policy and for the academic counselling of undeclared majors at the college.

Spring Term January Admissions has attracted increasing numbers of special students to its five introductory courses in English, French and political science, sociology and mathematics. Over the three years of its operation at the college, the number of special students has increased by some 73 percent from 155 in 1973-74 to 268 in 1975-76. Overall enrolment (despite a decrease in the number of courses offered) has increased 57 percent to 480 students over the three-year period.

Associated with the integration of faculty was a further integration of budget. The budget for all full-time faculty and for all sessionals teaching disciplinary courses is now the responsibility of the departments. Cut-backs have been effected in areas which are subject to the college budget, and it is expected that there will be further economizing.

Teaching Methods

The approach to instruction traditionally adopted by St. Patrick's College has been shaped by its goal of providing undergraduate instruction in the humanities and social sciences within a small academic structure which affords maximum faculty-faculty, student-faculty, and student-student interaction.

The French language program and intensive Spanish program were again offered in 1975-76 and are expected to continue. Some association of the French language program with Canadian studies will be investigated.

The practicum courses in community psychology were offered again in 1975-76. They are designed to supplement the theoretical and research orientation of the traditional program with supervised field work at the undergraduate level. Emphasis is equally on gaining applied experience and on active and detailed study of community

settings such as correctional institutions and centres for treatment and management of the retarded and the elderly. Readings, discussions, reports, and independent research are integrated into programs in the different settings.

The Unified Liberal Arts Program suffered a drop in enrolment in 1975-76 and, although the reasons for this are not clear, it is thought that many first-year students may be reluctant to commit themselves to a four-credit unit. Because of this possibility, in 1976-77 ULAP-1 will be a two-credit unit. The teaching methods used in ULAP will remain basically the same.

In the summer of 1975 a new course in economics was developed. The course (01.101M) was a self-paced section of Economics 01.101: *Contemporary Economic Issues*. During the school year a resource centre was open at St. Patrick's College on Saturday mornings and at other times designated by the teaching assistant. The course was organized with four introductory lectures. There were then six modules covering the subject area of macroeconomics. Following this there were three, mid-course lectures designed to summarize the sections on macroeconomics and to introduce microeconomics. In the microeconomics section there were also six modules. At the end of each module (both in macroeconomics and microeconomics), the student was given a number of randomly chosen, multiple-choice questions which were marked immediately upon completion. If the student passed, he would go on to the next module. If not, the student tried the same number of different randomly chosen questions at a later date. Three tries were allowed.

The course is considered successful and will again be offered in 1976-77 with the hope of an increased enrolment.

A new, interdisciplinary, two-credit course, *Biography and Autobiography* (04.303), will be introduced in September, 1976. Biographical and autobiographical texts will be studied from the viewpoints of literature, psychology, and philosophy, and their structural principles and relationships with their milieu will be examined.



Students

During the past year St. Patrick's has taken an active role in the university's high school liaison program. Through school visits, mailouts, and the publication of a new brochure, the college has attempted to make both potential undergraduates as well as guidance counsellors aware of the academic opportunities offered at St. Patrick's College. In the early fall, guidance counsellors from the Ottawa area were invited to an afternoon of informal discussions followed by the opportunity to sit in on classes and tour the university's facilities. Since this extensive publicity campaign has been established, we hope by its continuance that more students can be made aware of the offerings of both the college and the university.

With the exception of ULAP, there are no limits on the numbers of students that can be accepted into college programs.

Relations with the Community

St. Patrick's College has traditionally been heavily involved in community activities, primarily in the areas of social service volunteer programs, off-campus instruction, and its more recent sponsoring of major Canadian plays.

Annually the students of the college organize and conduct a canned-food drive, the recipients of which include the Salvation Army, St. Joseph's Mission, the social service groups of the Anglican and Roman Catholic churches, a number of half-way houses for former prisoners, as well as those for the former patients of the Rideau Regional Centre in Smiths Falls. Some 200 students were involved in the canned-food drive with over 12,000 cans of food collected for these charitable organizations.

Additional volunteer programs serviced by the students of St. Patrick's include: (1) the probation program of family court's juvenile (sixteen and under) division (four to five students involved annually); (2) the Good Companions program for senior citizens (six to eight students annually); (3) ward assistance program for the Children's Hospital of Eastern Ontario (fifteen to twenty students annually); (4) the Group, a ward assistance program for the Rideau Regional Centre at Smiths Falls (fifteen to twenty students annually).

In addition, plans are being made for student involvement in a weekly remedial instruction program at the training school in Alfred, Ontario, and in the fall of 1976 St. Patrick's College will be host for a senior citizens' day, sponsored by the Ottawa Council on Aging, designed to inform senior citizens of the educational opportunities available to them.

Apart from student-initiated programs of this sort, the members of the psychology department teaching at the college undertook to organize student participation in the programs within correctional institutions as part

of the practicum courses referred to under "Teaching Methods". This involvement took psychology students to the Burritt's Rapids Correctional Centre and also involved them in the work of Alcoholics Anonymous. Considerable success was also achieved in the college's off-campus offering — a psychology course given in Carleton Place.

In November of 1975, St. Patrick's College had the pleasure of presenting to the university and Ottawa-area community the NDWT Theatre Company's production of James Reaney's trilogy of plays on the Donnellys: *Sticks and Stones*, *The St. Nicholas Hotel*, and *Handcuffs*, as well as lectures by the playwright and by Orlo Miller, author of *The Donnellys Must Die* and *Death to the Donnellys*, who worked with Reaney on the research for the plays.



The college's presentation of the Donnelly trilogy resulted from the involvement of a member of the English department as liturgical adviser to the playwright and the cast, primarily in the final play, *Handcuffs*. It was through the efforts of this member of faculty that the production was brought to Carleton as part of a much acclaimed, Canada-wide tour of the trilogy. The college's opportunity to host the trilogy received the valuable support of the Information Office, the administration, and not least of all the students themselves who helped in publicizing the plays, selling tickets, and ushering for the performances. A similar production is being planned for the spring of 1977 when Reaney's *Balloon* will be presented by the college.

Faculty of Science

Dean's Introduction

The year saw an increase in course registrations in science similar to those experienced in previous years. In the undergraduate program course registrations increased by about 4.5 percent over 1974-75, while enrolments in the graduate school increased by 15 percent. There were 80 graduates in the B.Sc. three-year program as compared with 95 in 1974-75, whereas there were 117 graduates in the four-year program as compared with 98 in 1974-75. These figures exhibit a growing preference of students for the four-year as compared with the three-year program. In the graduate program thirty M.Sc. degrees and ten Ph.D. degrees were awarded as compared with twenty-seven and seven respectively in 1974-75.

During the year the Department of Mathematics was appraised by the Advisory Committee on Academic Planning (ACAP) and it was recommended that the department continue its doctoral programs in pure and applied mathematics and statistics and that its interdepartmental program (with engineering) in Information and Systems Science be implemented. This recommendation, which is essentially a commendation of the work of the department, is a source of satisfaction to the department and the faculty, representing as it does external verification of a view long held within the faculty. The Department of Biology is the sole remaining department to be appraised. This is not expected to occur for some time yet as appraisals of these departments have not yet begun within the province.

A feature of the year was the presentation of an "open house" by the faculty. The event drew an astonishing amount of enthusiasm and co-operation from within the faculty, and the response of the public was also gratifying. It is intended, henceforth, to present such events every other year, alternating with the engineering presentations.

While the work of the faculty has continued in satisfactory fashion, there has been little growth and few new departures, a necessary consequence of the diminished support accorded the faculty in the immediate past. The increased numbers of students have been accommodated with difficulty and two departments, biology and geology, and one program, biochemistry, suffer from insufficient personnel to supervise senior students. The prospect of limiting enrolments in these programs must shortly be entertained. Appointments of adjunct professors has been increasing, though these scientists make their contributions in the graduate school and, therefore, do not assist in any way in relieving the shortage of supervisors for the senior undergraduate students.

Departments have been broadening their horizons by offering programs which contain more studies of an

applied nature. This step is being taken with the aim of providing students with a background which will assist them in their search for employment after graduation. There is no question of replacing the fundamental studies which must form the basis of students' training if they are to be thorough-going professionals, but rather the goal is to provide the students with some readily saleable expertise which can provide them with an immediate advantage on first leaving university.

The matter of decreased financial support for science relative to the other faculties is one which continues to cause anxiety and puzzlement. The goal of the faculty is to become a member of the first tier of Ontario faculties of science in terms of academic excellence for those fields of study in which we have chosen to specialize. Our Department of Mathematics has already achieved that status and indications to date are that other departments have also reached that state or are not far from it. In short, the goal is readily attainable. This is a vindication of the efforts of those scientists and academics who over many years exercised intelligence and devotion in the task of building the faculty. But the withdrawal of support from the faculty in a process of "re-allocation of resources" continues and places the goal of the faculty and, indeed, its effective operation in jeopardy. One more slash of the knife, one more thoughtless blow of the hatchet, and an unconscionable and irreparable act of academic vandalism will have been perpetrated.

J.L. Wolfson

Programs and Policies

Biology

The total number of honours and majors students in biology continued to grow, almost entirely in the honours B.Sc. program. This was especially reflected in the increased enrolment in fourth year, and in the large numbers of honours research projects from the programs in biology, biochemistry, integrated science, and biology/geology. The shift to an excess of honours over pass graduates in biology began two years ago and continued during this past year.

No new courses were introduced, but an exhaustive review of undergraduate offerings was made by the Curriculum Committee in order to ensure that duplication was minimized while lacunae in basic programs were avoided. The involvement of adjunct professors in the graduate program was again reviewed, and mechanisms were adopted to facilitate a normal flux of active participants in the supervision and instruction of graduate students in biology.

The most notable events of the year concerned research in the department. Despite the freeze in budgets for support of university research, the National Research Council (NRC) slightly increased its total award in oper-

ating grants to the Department of Biology. More significantly, the department received one of eighteen equipment grants awarded to 141 applications by the grant selection committees for biology, and one zoologist was awarded an extraordinary grant in mid-year in order to expand the equipment needed by his group studying ultrasonic communication among bats and insects. An unusual grant was also received from the Atkinson Foundation for embryological research with potentially broad implications. And finally, one member of faculty was granted signal recognition for his research contributions in cell biology when he was elected a fellow of the Royal Society of Canada.

The biology department intends to continue to respond to the demands of students and community by providing a high standard of professional qualification in biology, even though this entails an emphasis on expensive, practical experience in the laboratory and in the field. The pass program in arts will be adapted to serve as an alternative for students whose goals are more specifically toward the interface between the social sciences and biology, or toward a descriptive aspect of biology. Because the current demand exceeds available resources, the department is in the position of being able to, even obliged to, raise its admission standards into graduate studies and into honours in order to limit student numbers.

No new programs are under active consideration at this time, for current budgetary allowances are scarcely sufficient for the survival of existing programs at the recognized standard. The energies of the teaching staff have been so taxed that little time or energy is left them for pedagogical creativity. Part-time students are integrated as much as possible into regular programs, with the understanding that all mandatory undergraduate courses will be offered in summer or evening session on an approximate three-year cycle, and the more popular optional courses approximately every five years.

The restriction in the budget for sessional lecturers resulted in the cancellation of two courses in invertebrate zoology at the second- and fourth-year levels, even though these are especially important options for students interested in aquatic ecology or entomology, one of the departmental specialities. Next year another optional course designed for non-scientists has been withdrawn in order to free personnel for an evening section in a parallel core course. The effective reduction in the part-time lecturers' budget has increased the burden on full-time faculty in some areas, notably zoology, and reduced the department's capacity to utilize Carleton's peculiar resource, the expert personnel of Ottawa's government laboratories and agencies.

The replacement of instructional equipment has once more failed to keep abreast of the inevitable depreciation and, while no disastrous breakdowns occurred in 1975-76, the university is only postponing and amplifying the inevitable.

Chemistry

The Department of Chemistry continued its teaching and research activities during the 1975-76 academic year with modest increases in the number of student courses taught and the graduate student population.

The pass degree program produced seven graduates over the past year, with three graduating at the spring convocation. It appears that the honours program is attracting most chemistry students presumably because of two factors: (1) a better level of student in general is pursuing chemistry as a career; (2), and probably more important, entering students are particularly sensitive to employment opportunities of late — honours graduates appear to have little problem in finding positions to their liking.

In graduate work the department continued a vigorous and effective program. In late 1975 the Ontario Council of Graduate Studies recommended: "the Ph.D. program in Chemistry proposed by Carleton University in the area of bio-organic chemistry and metal ions chemistry be approved. In making this recommendation the Appraisals Committee notes the commitment of Carleton University to the continued involvement of adjunct professors and to continuing collaboration with the Department of Chemistry of the University of Ottawa."

It was gratifying for the department to note that those areas in which it was convinced that it showed strength at the Ph.D. program level received the vote of confidence of a group of examiners whose findings are available and outline the strengths and weaknesses of the above mentioned Ph.D. programs.

The graduate student population in the Department of Chemistry increased modestly and the overall standard of incoming students was reported as being pleasingly high. Research funding attracted by members of the department totalled \$254,990. The majority of this fund (90 percent) was divided almost equally between the specialized bio-organic and metal ions research group. The up-to-date and brief description of research actually in progress in the department is given in the departmental publications, *Research in Progress 1975-76* and *Graduate Studies and Research in Chemistry 1975-76*, the latter of which is designed for wider distribution.

In many respects, however, the present budgetary situation facing science at Carleton is leading to a serious reduction in research effort as well as in our teaching capabilities. The present anti-science sentiments of the federal government appear also to be echoed in the administrative decisions at Carleton. Although the department can obviously continue its efforts, it is becoming increasingly difficult for faculty to keep up to date in laboratory and teaching and research. For instance, there are no means at all for the renewal or updating of equipment that is obsolete. In a discipline that is developing rapidly, it is essential to keep research at the forefront, and this can best be done by ensuring that equipment is the most efficient possible and with a capability com-

mensurate with the measurements required. This, in turn, means that the department must continually ensure that our supporting facilities are the best. If this problem is not resolved in the near future, fundamental research in chemistry at Carleton risks a slow and lingering death.

The activities and expertise of departmental members continue to be recognized in many ways. Faculty members are in demand as referees for external granting agencies and as examiners for theses from other universities; they make submissions to many journals for fundamental research as well. Departmental members are also in demand for the presentation of research seminars at other institutions and in the preparation of books and reviews. Many publications have appeared in the literature and papers have been presented at conferences resulting from research carried out in the department by faculty members, post-doctoral fellows, graduate and undergraduate students.

Active exchange and co-operation programs have continued. Visits were made by faculty members to the Soviet Union, Brazil, and France (under the Canada-France exchange agreement). A visiting professor from the Université de Languedoc, Montpellier, spent four weeks at Carleton under a similar exchange program, while a professor from Hungary is spending fourteen months in the department under the auspices of the Carleton-Hungary exchange agreement.

Adjunct professors have continued to be actively involved in various phases of the departmental program, having supervised either graduate students or fourth-year dissertation work. A graduate course was also given during the summer of 1975 on *Topics in Energy Conversion*, and our adjunct professors were also involved in undergraduate laboratory instruction.

Departmental program effectiveness continued to be assessed by the Curriculum Review Committee, as was teaching ability by either an internal questionnaire or, when organized, science faculty questionnaire.

During the past year the third-year laboratories were run under a new format involving specialized courses (half-credit) in each of the areas of organic, inorganic and physical chemistry. These three courses were well received and apparently this change has been a success. As outlined in last year's report, the several areas identified for development include: (1) an applied chemistry program, (2) use of adjunct professors for thesis-research supervision, (3) emphasis on part-time graduate studies, and (4) closer co-operation with the University of Ottawa for the development of graduate programs. During the past year a number of changes in these areas have been instituted.

The new third-year laboratory offering appears to have been a success and will doubtless form part of the core program for the future. And, in order to make the undergraduate program more flexible and attractive to students, the third-year lecture courses in organic and



inorganic chemistry will be bisected next year. The first half of these courses will be available for credit to pass program students and those who are majoring in other subjects. A half-course in industrial applications of chemistry marks a debut into applied chemistry without the necessity of hiring new staff. This course will be taught by a team of faculty and adjunct professors with experience in industrial chemistry. The success of this course will act as a measure for further developments in this field.

One possible line of expansion in the future was identified as being increased co-operation with the Faculty of Engineering, perhaps with the development of a joint chemistry/geology/engineering program in resource engineering. A departmental committee is exploring this possibility.

With an upper limit being placed on graduate enrollment, the department foresees more competition for acceptance into our program with a concomitant increase in the level of excellence of these candidates. Enhanced co-operation with graduate students of the University of

Ottawa is still envisaged, but the past year has been rather slow in this direction.

Unfortunately, the Faculty of Science inquiry into the possibility of an M.Sc. in Science Education did not reveal a real need for this type of program. On the contrary, it appears that such programs should be reconsidered based on comments made to this department from outside sources. This is perhaps one area in which the department can move.

The problem of attracting part-time students from local laboratories (presumably federal government) has not been solved. This source of untapped clientele should, in principle, be available for some form of graduate work.

It is becoming more and more important to maintain the level of operation of our various pieces of research equipment. This can only be done by updating or replacing obsolete equipment and repairing out-of-service equipment. It is apparent from current budgets that the equipment portions are far too low. All too often makeshift repairs are made or essential repairs delayed for financial reasons. It is imperative that in the near future some mechanism be instituted for cyclical renewal of major equipment, both for teaching and research purposes.

The turnover of staff is still a severe problem, although it is difficult to say whether this is because of the salary situation. In order to attempt a balanced budget for the part-time salaries component, the department reduced the funding available for marking and the number of senior demonstrators in Chemistry 100. Both of these reductions resulted in an overall diminution in the department's teaching capabilities, especially in the number of junior course assistants. In future years the department hopes to reinstate the full complement of demonstrators, although it is apparent that other areas will have to suffer. It is impossible to expect the department to operate at the same level with much the same budget if salaries for student assistants continue to increase.

Geology

Geology remained in good health during the past year largely because of hard work on the part of faculty and support staff, despite increased pressure on its resources. Enrolment of undergraduate majors rose by 10.6 percent (the largest increase in the faculty outside of integrated science studies), and the number of full-time graduate students increased from twenty-four to thirty-one. The largest increase was in the second year; an unprecedented fifty-five students attended the two-week field camp at Cobalt, necessitating an increase in attending faculty from four to five and reducing the quality of life somewhat. In the university increased numbers required more human resources in laboratories. This need was not from the increased graduate enrolment, but supplementary funds for graduate teaching assistantships were required.

No radical changes in program were proposed or accomplished, partly because of limited resources and also because the new chairman chose not to attempt major

initiatives during his first year. The new senior course in coal geology and technology was successfully conducted for a dozen students. Conservatism regarding a new subject and novice sessional lecturers undoubtedly discouraged higher enrolment. The course will not be offered next year for financial reasons, but is scheduled again for 1977-78. The Faculty of Graduate Studies and Research approved the department's proposal of an M.Sc. degree by course in applied aspects of geology. As yet, formal programs have not been specified. Two students, in energy resources and mineral economics, will be in the program next year; these are streams which the department hopes to develop in the context of the department's current specialties at the graduate level.

The department bade goodbye last fall to two academic visitors in the Leningrad-Carleton exchange, one of whom was the first to come to Carleton from Leningrad under the terms of student exchange as a post-doctorate fellow. Among other distinguished academic visitors was a professor from the University of Adelaide who continued his collaboration on Precambrian fossils begun in Australia during the 1974-75 year.

The department's remarks in last year's report remain valid: if it is to develop along its ordained lines, fully approved and endorsed by ACAP and the university, an increase in faculty is necessary. Geology recently suffered, along with the rest of the Faculty of Science, in a climate of decreasing support in the university. It is to be hoped that the tide is turning. The department's avowed specialties are most germane to present social needs posed by diminishing resources, and it is reluctant to limit enrolments formally. Employment prospects are strong and improving; some seasonal positions remained unfilled this year. There is, in Ottawa, particular need to provide educated persons for the increased public-sector participation in mineral and energy resource planning and development.

Despite these convictions, the department will address, during the coming year, the question of whether some curriculum changes can be effected so as to give some faculty members more time for new pursuits, students, and research. It will also attempt to identify new physical resources needed to cope with limited human resources.

As indicated above, the department is interested in developing graduate studies in the areas of mineral economics and non-renewable resources; the fate of these interests will depend very much upon the degree of support and co-operation obtained within the university.

An active sector of senior undergraduate and graduate planning concerns co-operation with the University of Ottawa. Next year an experiment will be launched in which the entire class of a senior half-course in sedimentology will be taught at the University of Ottawa. Special transport and timetabling will be involved and, if successful, this trial will lead to further, reciprocal interlocking of programs in the two departments.

In co-operation with the Office of Continuing Education, the department has agreed to a request from the Ontario Educational Communications Authority to stage three, one-day field trips to supplement a series of programs on earth science to be broadcast next fall on TV Ontario. Favourable response may lead to an "open university" course in introductory geology the following year.



Mathematics

Carleton University is in the uniquely fortunate position of being in the national capital region which is the centre of activity in Canada in many of the mathematical sciences and which provides career opportunities in these fields to graduates. A welcome development is the close relationship built up during the last few years between members of the department and the research-oriented professional mathematicians and statisticians in the Departments of Agriculture, Environment, Health and Welfare, the National Energy Board, Statistics Canada, and the National Research Council.

The Department of Mathematics now has the broad range of programs needed in the present context which includes: (1) mathematics for non-mathematicians, including first-year mathematics for students in all faculties as well as upper-year courses for engineering, science, and social science students; (2) honours and pass programs in mathematics; (3) honours and pass programs in the mathematical sciences; (4) combined honours and pass programs in computing science and the mathematical sciences; (5) M.Sc. programs in Pure and Applied Mathematics and in Probability and Statistics; (6) M.Sc. program in Information and Systems Science; (7) Ph.D. programs in Pure and Applied Mathematics; (8) Ph.D. in Probability and Statistics.

Throughout 1975-76 the Department of Mathematics

maintained its close co-operation with high school teachers. Faculty members visited high schools throughout the region to give talks and to attend professional development days. On-campus lectures for senior high school students and their teachers were organized; these were entitled — "Mathematics: the legend and the fact"; "Oscillation, stability and the price of beef"; "Computer Graphics: an aid to Mathematics"; and "What are the odds?" The department was also awarded a grant of \$4,000 by the Ministry of Colleges and Universities for the purpose of awarding scholarships to outstanding high school students to attend the summer school training program for gifted young mathematicians run each summer at the University of Chicago by the National Science Foundation. The choices are made through a competition, teachers' recommendations, and an interview. Finally, with the co-operation of the Instructional Development Office, a workshop in mathematics education was held on April 6, 1976, for the mathematics department and local high school teachers. The speaker was a faculty member of McArthur College, Queen's University, who spoke on "Back to Basics in Mathematics".

With respect to its undergraduate programs, the department gave major consideration during the past academic year to the problem of the large variation in the level of preparedness in basic mathematical skills among first-year students, including a significant number who have a noted deficiency in this regard. Whatever a suitable long-term solution to this problem might be, the department felt called upon to take immediate steps to alleviate it. As a first move, the department abandoned full courses in favour of semester courses, giving much more flexibility in course selection and allowing a student who fails first year calculus at Christmas the opportunity to repeat it immediately, rather than a year later. Moreover, teaching sections of multi-sectioned courses were "streamed" so that students with similar abilities and needs can be in the same classroom. The streaming of students is to be based upon a placement test which will also serve to identify students with unacceptably poor command of basic skills. The latter category of students will be required to take a new half-course on pre-calculus mathematics before continuing with first-year calculus and algebra.

At the graduate level the Department of Mathematics arranged a co-operative internship training program with the federal government. This program permits students pursuing the M.Sc. degree with a statistics emphasis to gain practical experience in applied statistics to complement the theoretical knowledge gained from course work. A student is required to spend two, four-month work periods with his employer, and at least one term in full-time study in the mathematics department. During the work terms, the student also registers for at least one course in the evening division at Carleton. A thesis based upon the project assigned to the student by his sponsoring government department must be submitted.

Physics

A complete review of the undergraduate honours courses was completed this year. The object was to ensure that the necessary topics had been covered without gaps or redundancies. Some minor adjustments were found necessary and it was felt that the most urgent field for revision is in the first-year laboratories.

With respect to service courses, the offerings for the Faculty of Engineering are still felt to be far short of being satisfactory. However, where the fault lies is still unclear. Conversations with the Faculty of Engineering are continuing and the department hopes that from these discussions there will emerge guidance as to where renewed effort is likely to be most profitable.

It had been the department's hope that a program on reactor physics could be introduced and this was to be an offering under the general heading of applied physics. Some individuals from engineering and from Atomic Energy of Canada Limited (AECL) offered their assistance so that a well-rounded program would be available. However, there appeared to be some doubts as to how the program would be perceived by the provincial authorities, and so it was decided that for the present the department's two physics courses would be offered as options. These courses, Physics 75.553 and 75.554, were given; in the 75.554 course there were two invited lecturers, from Chalk River and from the Faculty of Engineering. At the end of the course, the students spent three days experimenting with the SLOWPOKE reactor at Tunney's Pasture laboratories of AECL, Commercial Products. The success of these courses augurs well for the return to the original plan of a reactor physics program.

The high energy physics group also had a successful year. The studies of quantum electrodynamics through muonic atoms, referred to in the previous report, have now reached a point where all the discrepancies between theory and experiment have been resolved. This represented the culmination of the efforts referred to previously, and is an outstanding example of the kind of collaboration possible between theoreticians and experimentalists at the same institution.

Other experimentalists from the high energy group were engaged at the Fermi National Accelerator Laboratory (Illinois) and the Stanford Linear Accelerator Center (California). At the former, studies on special cases of the two-body interaction through neutron bombardment of beryllium, production mechanism of excited K particles, and interactions between w and p particles were conducted. At the latter, a study of the interaction between K particles and protons was being carried out with the aid of a very powerful particle spectrometer; in this instance, the Carleton contribution was part of a collaboration among several institutions.

A program of instrumentation for high energy physics continued, and development in instrumentation for solid state and medical physics proceeded as offshoots

from the main program. The programs in medical physics (bone densitometry and radiography) and laser physics (arc formation and high resolution spark chambers) also continued.

At the undergraduate level, the next few years are likely to see a revision in laboratory teaching. The traditional laboratories are looked on by high school graduates as somewhat uninspiring and only slightly above what they have already done. This judgment is not altogether accurate, but it must be met. In particular, it is felt that the best students should be given more flexibility and greater depth in their laboratory work.

A small study is underway to determine whether, by utilizing the latest technology, it may be possible to give a much better form to the laboratory experiments employed in off-campus teaching of first-year physics. In addition, a committee has been formed to take a long-range look at the development of our undergraduate offerings, honours, major and service courses.

A committee has also been formed to make a long-range projection of the department's research and graduate studies programs. This committee will try to respond to the changing centres of interest in the world of physics, and to the changes in strength of the department. Both growth and phasing out of existing programs will be considered with a view to having a strong department. These two committees are to report by September, 1976.

Because of the durable nature of physics equipment, the effect of the budget of 1975-76 was only to curtail growth in the laboratory offerings. No reduction was necessary in equipment, although the number of sessional lecturers has been severely cut back.

Biochemistry

The program in Biochemistry, co-ordinated by a committee whose members are drawn from the Departments of Biology and Chemistry, continued to attract a high proportion of students of above average ability. Biochemistry provides a good example of co-operation within the science faculty, and the success of the program depends to a large extent on the co-operation between the biology and chemistry departments which provide personnel, space, and supplies for biochemistry courses and administration.

Student numbers are slowly increasing and currently there are about sixty-five enrolled. This number does not compare too accurately with numbers for other departments since students are encouraged to apply for biochemistry only after they have completed first year.

Encouraged by solid student interest, and the quality of students attracted, the committee discussed the possibility of formation of a department of biochemistry. However, with the present staffing problems it seemed unrealistic to attempt this at the moment, since additional appointments would be needed to provide a viable unit and the committee could continue to function adequately for the time being given the continuing good-

will of the parent departments. One problem has become more pressing — that is the need for research supervisors for the increasing number of fourth-year students. This above anything else in our program has put strain on the resources of the biology and chemistry departments. Should the possibility of a science faculty appointment arise, the committee would wish to make a strong plea that the appointment area should be chosen to give some relief to this problem and the problem of providing advanced course options for the biochemistry students.

Little change in the program is seen at the moment, other than an attempt to provide (next year) more choice of offerings at the 400 level. The rigorous curriculum of high-level courses makes the later stages of the program virtually unavailable to evening/summer students.

All functions were supported from the Departments of Biology and Chemistry budgets. This cut down on additional administration but was limiting in some ways, for example, the financing of visiting speakers.

Integrated Science Studies

The Integrated Science Studies program operated at what seemed to be, at least temporarily, a steady state. As suggested in last year's report, this is satisfactory to the committee responsible for the program for several reasons. The only major innovation of the past year was the explicit recognition of programs leading to joint degrees with computing science. This is valuable because the computing science non-science area has become quite popular, and a clear definition of the standards for explicit recognition in that area has been needed.

The changes anticipated in the near future turn on a proposal in the science faculty to allow for more inclusion of engineering courses as science continuation credits. This should open new opportunities for students interested in the combinations of science, technology, and administration. It should also improve flexibility as both steps will make it easier to recruit part-time students. But, as stated last year, a review of admission for students holding non-university qualification is the leading necessity before part-time work in integrated science studies can expand greatly.

Student activities this year were similar to those of the year before. As the honours program develops, the committee continues to see expansion in the range of graduate study opportunities toward which this program can lead. Some examples include: law, landscape architecture, information science, international affairs, and medicine. The scope of original work reflected by the honours essays was interesting as well.

Science Workshops

The 1975-76 academic year witnessed certain problems in the operation of the Science Workshops. It was difficult to meet stated objectives inasmuch as the permanent staff had been reduced by two positions as an economy

measure. Some 82 percent of the shops' efforts was directed toward the science faculty, amounting to about 19,000 man-hours. For these services the faculty reimbursed the shops in the amount of \$61,000. The remaining 18 percent of work performed was split between projects for the university's remaining faculties and Carleton University collaborations with other research institutes.

Large new constructions included the building of a Cerenkov counter for the particle physics program and the manual 20-ton press for the School of Industrial Design. Purchases were made of new metric machinery in accord with recommendations for replacement machinery. The policy of continuation toward metrification in general was carried out.

The workshops continued to hire part-time help to cope with its workload. Part-time staff provided 3,900 hours and enabled the shops to take on tasks which otherwise would have had to be refused. Employment of part-time personnel will continue to be a feature of the shops' operation for some time in the future.

Teaching Methods

In general the departments of the Faculty of Science have utilized teaching methods that can be described as the classical lecture and laboratory routine involving additional field experience and problem solving, all of which tend to make quite heavy demands on a student's timetable. With respect to the modes of instruction employed, the point must be made that in this area of the university certain innovative methodologies using audio-visual and other aids simply cannot compensate adequately for real materials and people, since these departments are unique in the amount of natural materials used and the personal demonstration necessary to learn about them.

One of the major developments has been the dramatic increase in the use of the computers as part of the educational process. Over the past year in the mathematics department alone undergraduate usage of the computer nearly doubled and now accounts for approximately 68 percent of the Faculty of Science usage. The chemistry department also undertook to offer a mini-course in computer techniques for chemistry majors during the first week of term.

Modularization of a senior-level course in metamorphic petrology was introduced in the geology department and, in addition, the department agreed to stage three, one-day field trips to supplement a series of programs on earth science to be broadcast next fall on TV Ontario. Favourable response to such endeavours may also lead to an "open university" course in introductory geology in the future. The physics department is also giving consideration to the possible offering of first-year physics by means of a form of open university teaching.

An experimental section of Chemistry 100 was described last year. This was offered this year and consisted

of eighteen required modules which covered the normal course content and replaced the usual lecture format. Each module contained a statement of objectives, self-tests, and readings. A grade of 70 percent or better on an examination covering the material in each module was required before the student could proceed to the next module. Of the twenty-eight students originally enrolled in this section, eighteen wrote the final examination (common to all sections). Student response was generally enthusiastic, and final exam results were significantly above the overall Chemistry 100 average (62 percent vs. 48 percent).



The mathematics department has introduced scheduled tutorials in all courses through the third year and there has been a greater involvement of graduate student assistants in this activity. In most cases graduate students are viewed as being an essential component of laboratory instruction, and in the Departments of Mathematics, Chemistry, and Biology a limited number of senior undergraduates are employed as junior demonstrators/course assistants.

Students

The recruitment of undergraduate students and attempts to publicize departmental programs and activities were most emphasized by the mathematics department. The number and range of activities were quite extensive. In addition to the activities described in an earlier section of this report, the department updated its program brochures and posters, sending these to all secondary schools in the region. As has been the practice, the members of the department also contributed to a scholarship fund

which makes possible the Department of Mathematics Entrance Awards.

The chemistry department continued to rely upon the Eastern Ontario Science Education Centre for valuable contacts with chemistry teachers in the area, and an additional aspect of this indirect form of recruitment by the department was the provision of laboratory use to several secondary school students under the auspices of the centre's program. In addition, several visits to the department were arranged by local teachers and members of faculty often visited local secondary schools to lecture.

The Integrated Science Studies Committee reported that in the area of recruitment it continued to encounter the problem of explaining the flexible and varied opportunities that its program offers. However, the committee found that the most successful approach was the publication and dissemination of brochures outlining several model programs open to the student.

Aside from the general coverage of undergraduate programs in a brochure prepared by the Information Office on the faculty, no special steps to recruit undergraduates were undertaken by biology (in view of constraints of space and instructional budgets), biochemistry, physics, and geology.

At the graduate level, two departments (chemistry and math) actively undertook to recruit students. The mathematics department circulated two posters describing departmental programs and activities to all Canadian universities and throughout the federal government. In the way of publicity, the Department of Chemistry placed advertisements in *Chemistry in Canada* (following the guidelines approved by the Committee of Chairmen of Ontario Universities), published an up-to-date booklet on research in progress as a means of informing other researchers and students of actual research programs, and supplied all local federal government laboratories with publicity material concerning the department's M.Sc. program in Chemical Analysis involving part-time studies. Other efforts included the provision of competitive graduate student stipends and the personal contact by faculty members with other staff and students when visiting other universities.

Again, because of space and budgetary constraints, the biology department undertook no special recruitment of graduate students. The Departments of Physics, Geology, and the Biochemistry Committee also reported that no special steps had been taken to recruit students actively. However, the comment was made that the loss of several top applicants to other universities seemed to indicate that either the department's "salesmanship" was inadequate or its ability to compete was being hampered in some other way.

With respect to limitation of the number of students accepted, most departments reported over-taxed resources either had or would soon result in limits being imposed in various program areas. Biology reported that it would like to limit the number of fourth-year honours students

and graduate students to sixty each, including about one-third as part-time students. Chemistry expressed the view that in keeping with the present policy of a limit on graduate enrolment, an upper limit of thirty to thirty-five graduate students (mostly Ph.D.) would provide the best ratio of staff to student that could be supported by present facilities. Mathematics reported that in certain fields, such as probability and statistics, further growth will have to be very carefully monitored so as not to overstrain resources; however, it noted that the only enrolment limit existed at the Ph.D. level where enrolments were nineteen full-time and seven part-time students, not far from the optimum size for the department. The department concluded that in all fields of mathematics the departmental trend is very much toward increasing present high standards and stabilizing enrolment. While there was no need to limit undergraduate enrolment in physics, the department reported that the changes in the engineering admissions policy might place some strain on the department's laboratory facilities; at the same time, it is expected that enrolments can be handled adequately. At the graduate level, the department reported that the number of students could ultimately be limited by the research funds available as it has limited the number of potential students in the medical physics program. In view of the change of provincial support for graduate students, the department reported that it will endeavour to keep the total number from increasing.

Most science departments felt that the calibre of undergraduate students had undergone no marked change; however, all reported a noticeable increase in motivation and departmental involvement. Students within the faculty were active on committees and, as elsewhere in the university, have revived departmental clubs and societies that have long been dormant. As a particular case in point, Carleton will be hosting the Canadian Undergraduate Physics Conference in the fall of 1976, largely as a result of the energy and enthusiasm of one of the physics department's more gifted students.

At the graduate level, chemistry reported a much higher calibre student body than in previous years, as did geology. In general, chemistry students were felt to have had no trouble securing employment, although it was noted that Carleton's location in Ottawa and subsequent contact with many government laboratories was an added advantage. Geology expressed considerable concern over the severe restrictions being placed on graduate study by non-Canadian students, noting that the cosmopolitan aspect of the department's graduate body had been a source of strength. Biology reported on a somewhat different aspect of graduate students, namely, the fact that most seem less impatient to graduate despite a strong commitment toward professional careers. Perhaps as a result of the uncertainty of employment, the department reported more students linger on a part-time basis in attenuated programs of study.

Relations with the Community

As with most others, the departments of the Faculty of Science maintained active involvement with both the academic community and the community at large by means of professional and non-professional activities such as editing and reviewing theses and manuscripts, consultant work with government and industry, serving in the organization of symposia and conferences, presenting papers for a variety of learned societies, and participating in the activities of a number of local community and national groups.

Members of the biology department were heavily involved in campaigns to improve public awareness of the plight of Canadian biomedical research which, with other areas of basic research, has suffered from steadily worsening shortfalls in funding.

Aside from the community at large, the Department of Geology served important communities in industry and government. Several major field thesis projects were funded by industry, including a volcanologic study in Nicaragua supported by an associate of Noranda Mines and a comprehensive study of an ore deposit in the Northwest Territories by Texasgulf, Inc. Continuing contacts with the private sector by faculty and research students in geology were essential to the health of both parties. Similar comments can be made concerning the public sector; both federal and Ontario geological surveys supported student and faculty research.



Faculty of Engineering

Dean's Introduction

The academic year 1975-76 presented the faculty with two major problems: first, the increased demand for admission; and second, the constraints imposed by our operating budget which, in terms of purchasing power, has been considerably reduced.

As a result of the increase in first-year enrolment in engineering, both the teaching and physical capacity of the faculty have been fully extended. The resulting large classes produced some problems, especially in connection with the size of our laboratories and lecture rooms. The faculty facilities are now loaded to a saturation point and some restrictions on enrolment may have to be applied next year. However, it is with pleasure that one can observe the increased number of women in undergraduate engineering programs.

The impact of the decrease in purchasing power of the operating budget represents a very serious threat to the faculty as to the future quality of some of our efforts — especially those related to laboratory work. This problem is facing most, if not all, Ontario faculties of engineering. Nonetheless, our two main goals are basically unchanged from the previous year, namely, continuation of our undergraduate engineering program which is typified by a unique three-year common core, and the provision of advanced study and associated research facilities related to post-graduate activities.

Within the Faculty of Engineering during this year we were fortunate to obtain some valuable new appointments in the Department of Civil Engineering. This has already manifested itself in an increase in the demand for post-graduate places in civil engineering.

During the past academic year the Department of Mechanical Engineering had two visiting professors, one from Imperial College of Science and Technology (London University, England) and one from Cambridge University, each of whom delivered a graduate course. It is hoped that such visits will be continued in the future.

The interdisciplinary Energy Research Group has been involved in problems of energy conversion and transportation. Its activities are generating increasing interest within the government and private sectors. And the Department of Electronics continued the development of its Instrumentation Laboratories as one of its major efforts in research.

The Department of Systems Engineering and Computing Science has been very active in the field of communications, one of its main thrusts being the Wired City project. The link via satellite with Stanford University in California will enable Carleton University and Stanford to share some courses this year on an experimental basis.

The participation of the department in the Communications Technology Satellite Program will provide the Ottawa community with a unique opportunity to register in Stanford University courses. These courses will be presented at Carleton through a combination of live and recorded television with two-way voice and credit will be given for equivalent Carleton courses.

Architecture has again been faced with a very large number of applicants for enrolment from which only a very few were accepted due to the restrictions of space and personnel. Similar restrictions also applied to enrolment in the School of Industrial Design which is developing as planned with a very satisfactory intake of students and a full complement of academic staff.

Constraints may have to be applied in the future to some post-graduate activities in view of the large number of applications as compared to the number of available openings. This applies in particular to the Departments of Electronics and Systems Engineering and Computing Science. In the field of electrical engineering, the number of students obtaining higher degrees has been second largest of universities in Canada. In mechanical and civil engineering the number of post-graduate students is also very near the saturation level.

The members of staff are continually involved not only in the operation of our undergraduate and graduate programs and in their own research, but also are increasingly involved with environmental and community problems. Carleton University's objective in education, both at the undergraduate and graduate levels, has always been oriented towards the acquisition of a body of knowledge as well as the development of a set of professional attitudes. Our aim is to provide the fundamentals which, mixed with methodology and the inquisitiveness of the young mind, formulates the basis of the successful professional career of our graduates on every level.

In this context our educational aim is: to educate the leaders of the engineering community who can not only solve but also formulate present and future engineering problems. With the unique common core undergraduate program (three years common) and an additional year of study by the student, successfully completed, the student can earn the degree of Bachelor of Engineering in Civil, Electrical, or Mechanical Engineering. Graduate studies leading to the Master of Engineering (M.Eng.) and Doctor of Philosophy (Ph.D.) degrees are offered in the following fields: (1) M.Eng. in Aeronautical, Civil, Electrical, Mechanical and Materials Engineering; and (2) Ph.D. in Aeronautical, Civil, Electrical and Mechanical Engineering.

The total undergraduate enrolment for the 1975-76 winter session was 1,201, with a total graduate enrolment for the same period of 271. The staff consists of 75 full-time members and a substantial number of sessional lecturers and visiting professors.

M.C. de Malherbe

Programs and Policies

Civil Engineering

The department began the year with four new faculty members, and with such an influx of youth into the life of the department the rate of activity increased very rapidly. As a result of new faculty and consolidation and changes at the graduate level, the department is now considerably stronger than it has been in the past.

Within the department work is at present concentrated on further improvement of undergraduate courses with an additional emphasis on graduate work. The addition of senior staff added considerably to a more realistic and professional approach to teaching of fundamental undergraduate courses, and the students have responded to this challenge enthusiastically. The efforts in terms of research grants have also met with considerable success. There is now a degree of funding available from sources other than the National Research Council (NRC).

Over the next four years or so, the objective of the department will be to improve the image of civil engineering at Carleton University. We hope to maintain the excellence claimed in undergraduate teaching and develop the program along with the other departments in the faculty and the university.

At the graduate studies and research level, the goal of the department will be to realize the potential it possesses. Using currently available sources of financial support, some movement in this direction is possible, but attempts to develop adequately larger grants based on group activities are necessary and are already being undertaken.

No new programs are now being formally considered. Initial consideration is being given, however, to course patterns in building design and construction. This area, to be developed in co-operation with the School of Architecture, will require new courses in the areas of project and construction management. The possibility of arranging such courses so that they are available to non-full-time students will be closely examined.

No changes have been made in this department that are perceived as resulting from the 1975-76 budget. In a general way, however, the lack of a large budget for equipment, travel, and small research projects has had its effects on the thought processes of the individual members. There is no way to measure the effect of a tight money climate on the behaviour of the faculty since ideas are discarded as soon as they are recognized as requiring financial assistance.

Electronics

A balance of activity has been maintained between the undergraduate and graduate research programs. In the undergraduate program the department has shared the responsibility for teaching electrical engineering with the Department of Systems Engineering, as in previous

years. The graduate program in electronics has been pursued with strong interaction with outside laboratories and industrial firms, and has represented a high level of research activity involving all departmental faculty. The numbers of students in undergraduate courses have increased somewhat in comparison with 1974-75, the greatest additional load being felt in the final-year projects. Graduate student numbers have also increased to thirty full-time and twenty-five part-time.

We have been fortunate in having a visiting faculty member on leave from Queen's University, Belfast, for the period January-August, 1976, who has made teaching and research contributions to the department in the area of microwave communications technology. The department has also benefited substantially from a new appointment in the areas of microwave electronics, instrumentation, and communications technology.

With the establishment and rapid development of the Applied Instrumentation Laboratory during 1975-76, the research activities of the department have been directed in two main but well-interrelated directions: solid state electronics and instrumentation. The field of solid state electronics ranges from semi-conductor devices to systems applications of integrated circuits, while instrumentation includes a wide range of measurement applications of circuit and radar techniques over the high frequency to microwave frequency spectrum. In all aspects of the research program of the department, strong association with government and industrial laboratories in the Ottawa area and elsewhere has been found highly beneficial.

The Applied Instrumentation Laboratory has also had a successful year. At the end of the year five Ph.D. and three M.Eng. students were working in the laboratory. Its financial support has been derived mainly from a contract from the Canadian Centre for Remote Sensing (EMR), and the provision of electronic equipment through a contract with the Communications Research Centre, in addition to NRC operating grants. Research has been pursued in the field of radar remote sensing and in a range of measurement and instrumentation problems. Attempts to broaden the range of activities of the laboratory through research contracts with outside firms and laboratories have been well received. It is clear that the employment prospects for graduate students who have pursued applied research under the conditions provided by the laboratory are excellent.

It is the policy of the department to continue with a balanced mode of activity between the undergraduate and graduate programs, with a strong research program involving all faculty members. However, the department is lightly staffed for the duties and range of responsibilities undertaken. Only by having a cohesive research program well integrated with the undergraduate teaching programs can it maintain its present effectiveness. No major change of direction is expected over the next four years or so. With the continuing rapid devel-

opment of electronics technology, changes in undergraduate elective course offerings and graduate course topics are to be expected, however. The tendency to go increasingly to applied research topics having strong relevance to practical needs of the outside professional community will be continued. It is believed that the Applied Instrumentation Laboratory will expand in its range of activities rapidly, supported by funds drawn mainly from research contracts and industrial research associations. The solid state device and circuits activities of the department are expected to develop in a similar direction. Contract support drawn through use of the integrated circuit fabrication facilities has been very encouraging during 1975-76 and is expected to grow considerably in future years.



The reduction in budget increases during 1975-76 has occasioned the continuance of two serious problems for the department; namely, deterioration of equipment position in undergraduate laboratories owing to an inadequate equipment budget and lack of funds for replacing of aging equipment, and increase in laboratory teaching loads due to increased student numbers. Provision of requested support staff would have alleviated this situation and resulted in greater effectiveness of laboratory courses.

Mechanical and Aeronautical

The department's activities at the undergraduate level experienced a considerable increase in first-year teaching due to a late increase in enrolment, and the increased load could only be met by the use of additional sessional help. The department has a very heavy commitment to the operation of the three-year common core program, a program unique to Carleton and which has been praised by various accreditation bodies. The professional activities of faculty members, encompassing teaching, research, consulting and committee work, have taken them to areas as diverse as England, Germany, Cuba, Korea, and Russia.

Over the next few years the department hopes to see the implementation of the Kirkhope Report which is aimed at consolidation and strengthening of the three-year common core program. The available elective courses in the undergraduate program have been arranged in different packages to cater to the immense range of activities which are the sphere of the professional mechanical engineer. These range from manufacturing processes and design to transportation technology and energy conversion. As a result, students will be encouraged to structure their elective program more than in the past. However, serious problems arise out of the increasing necessity to replace obsolescent equipment in the laboratories, for much of our equipment is over fifteen years old and maintenance is becoming a significant problem.

The M.Eng. program in Energy Systems Planning, proposed after discussion with the International Atomic Energy Agency and the Canadian International Development Agency (CIDA), still awaits satisfactory funding and cannot now start before September, 1977, at the earliest. The M.Eng. degree can now be done either by thesis or by course work, the latter approach being particularly attractive to part-time students. It is interesting to note that several experienced officers from the Canadian Armed Forces (CAF) have transferred from part-time to full-time status in the graduate program, and that they were asked by CAF to follow the course work option to give them increased breadth of knowledge.

Systems and Computing Science

During the past year the name of the department has been changed from the Department of Systems Engineering to Department of Systems Engineering and Computing Science. This change reflects both the involvement of departmental faculty with the computer in teaching and research and the role of the department in the university computing science program. In co-operation with the Department of Mathematics, the department offers a series of core courses in computing science which are available to the university at large. At the graduate level, our joint program with the Department of Mathematics in Information and Systems Science has once again been subject to appraisal. This time the appraisal was by the Advisory Committee on Academic Planning study of graduate programs in mathematics. The appraisal of the program was again strongly favourable and we still are looking forward to offering an M.Sc. in Information and Systems Science, since students are now studying this type of program in M.Eng. programs.

The department continues to invest considerable effort in continuing education. Our large, part-time graduate student enrolment continues to have approximately 100 students involved. Together with the Department of Electronics, Carleton's graduate program in electrical engineering is among the largest in Canada. The Department of Systems Engineering and Computing Science has offered a number of short courses to the professional

engineering community in Ottawa on the subject of micro-computers, and is continuing to offer short courses at competitive fees in this area.

It is clear that the department together with the Department of Electronics provides students with a very contemporary education in electrical engineering. The combination of information processing and electronic devices is at the heart of current technological advances. Graduates are immediately employable and are able to participate in the current explosion in information processing and computer applications. At the graduate level, plans are to continue to develop a program of studies which integrates communications, computers, and systems engineering methods into a program of studies in information systems engineering which is theoretically based but pragmatically oriented. It is planned to strengthen departmental offerings in systems engineering and computing science in a moderate way, with courses in simulation, computer system performance analysis, and software. No plans have been made to alter significantly the present program in the near future.

School of Architecture

The principal academic activity in the School of Architecture centred on major revisions to the course structure of the curriculum to bring the format and weights of the courses more in line with those across the rest of the university. The major change implied here will be the adaptation of a seminar format to teach design courses and a major reduction in the use of tutorials. This will require a completely different approach to teaching and a much heavier preparation workload. The other major change involves the introduction of sequential design courses requiring the student to progress through the school year by year. The net effect of these two changes should produce a more intensive design program and greater productivity, though reducing the range of choice for the student.

The report of the Architectural Study Planning Group (ASPC) of the Council of Ontario Universities sets out a series of recommendations for the long-range development of the School of Architecture at Carleton. Considerable effort has been put into preparing an implementation plan in line with these recommendations. Within the next few years the school expects to bring forward specific proposals to: (1) introduce a degree at the end of the fourth year; (2) modify the fifth year into some form of post-graduate professional training; (3) further adjust the first and second years of the program to reinforce it as a core program leading to three alternate programs in the third and fourth years (these alternate programs would be described under the headings, Architectural Studies, Building Studies, and Urban Studies); (4) increase the undergraduate enrolment to 400 students; and (5) introduce a Master of Architecture research-oriented graduate program.

The 1975-76 budget applied some rather severe con-

straints on this school. Aside from the general problem of never having enough academic resources to do the things desired, the school has felt the squeeze in other areas. Members of faculty are especially concerned about the lack of technical support for our building labs and photography and graphics workshops, particularly in the light of increasing activity jointly with the School of Industrial Design. A lot of equipment has been purchased which is not being looked after and which is impossible to control. Audio-visual services have been considerably reduced and an alarming proportion of equipment is wearing out. In general, the custodial and maintenance services have been stripped to the bone, and the building reflects this.

School of Industrial Design

The 1975-76 academic year was the first in which the school had its third year of the Bachelor of Industrial Design program in operation, with thirteen students. Curriculum and courses, together with those of a fourth year, were developed in 1974-75 and included in the 1975-76 undergraduate calendar, and approval was granted by Senate on January 13, 1975. The number of new courses added to the calendar were eight full courses and nine half-courses, of which four full courses and four half-courses were offered in the 1975-76 sessions.

Apart from the courses in the B.I.D. program, the faculty of the school prepared and taught a five-week course in sketching and presentation skills to a group of 240 first-year engineering students (two out of three sections) as a part of the course Engineering 88.100: *Engineering Graphics and Design*. This participation of the school comprised a workload of thirty hours for each student and was meant as an extension of the experiment with 50 students in 1974-75. Based on the results of the experiment, the school will make this course available to all first-year students in engineering, and eventually architecture, in 1976-77.

The core of third-year courses in the B.I.D. program was formed by the industrial design studio projects (85.330* and 85.331). These courses consist of an introductory portion till November, followed by a major project until the end of the second term, and have been modified in practice.

The basic idea of this core design is that the studio activity is intended to simulate the real situation in a design office, where the designer is working on several assignments simultaneously, with several deadlines to be met. Students are required to keep logbooks and hand in time-sheets at the end of each week, which are compared with the time estimates the students are expected to submit with the planning of the design activity at the start of each project.

At the request of the school, the Department of Psychology made course 49.382*: *Special Topics in Psychology* available as a half-course in anthropometrics and ergonomics. The course was given by the dean of social

sciences to the thirteen students of third-year B.I.D. exclusively. Unfortunately, the Department of Psychology will not make this course available in the future, so that the school has had to add courses on this subject to its own curriculum for 1976-77. The consequence of this is the necessity of hiring an outside sessional lecturer to teach those courses, since the Department of Psychology expressed no further interest in them.

The Advisory Committee of the school met in November, 1975, and May, 1976, with the faculty and discussed the possible and desirable expansion of the school. However, the 1975-76 budget, as was in principle planned in 1973, was overextended in all categories. The budget for instructional equipment has been used to purchase desks, drawing-tables, and further equipment for a project studio for twenty students, and for the equipment of the mass-production and mould-simulation laboratories and the plastics laboratory.

Grants from the Office of Design of the Department of Industry, Trade and Commerce which enabled the school to implement further the proposal of 1973 were also applied. Unfortunately, on April 26, 1976, the school was advised by the Office of Design that further grants could not be made available to the school for the time being, due to severe constraints in spendings of the federal government.

The development of the school as foreseen for the next few years is still in accordance with the proposal of 1973 and as referred to in the annual report of 1974-75. Possible deviations from the original proposal of 1973 were discussed at the meeting of the Advisory Committee and the faculty in November, 1975. Suggestions were considered for an expansion of the school in the field of graphic design, but the conclusion of faculty and the Advisory Committee was that an expansion was not desirable and that the school should concentrate on its objectives and programs as formulated in 1973 and strive for excellence in this program. The projected stable state of the enrolment (approximately 110 students in total) was also confirmed.

As a consequence, new undergraduate programs were not further considered. Although there is a desire to add a graduate program to the school, such a program is not considered opportune within the next five years. The desirability of programs in the form of special seminars for non-full-time students has also been discussed at the meeting of the Advisory Committee and the faculty in November, 1975. Remedial courses for mid-career industrial designers were considered to be especially useful. Much more study is required, however, to quantify the need, find feasible means to recruit students, and devise appropriate formats for such courses. Attempts to do such studies will be made in 1976-77.

Teaching Methods

For the most part the Faculty of Engineering preferred to rely upon the traditional combination of lectures, problem solving (in sessions with faculty assistance and in an individual format), laboratory demonstration and experiment, and design work, both group and individual.



However, a certain degree of experimentation in methodology was undertaken. The Department of Civil Engineering began work on developing a set of filmed graphics which will demonstrate concepts in vector algebra for use in Engineering 82.110: *Engineering Analysis*, whose enrolment was about 320 students. An intensive format for two, graduate-level courses was conducted in the Department of Mechanical and Aeronautical Engineering which utilized the expertise of visiting professors who are eminent in their fields and, while there occurred problems with respect to timing, the teaching commitments of the graduate students, and assessment once the visitor had left the campus, the new venture was felt to be a highly desirable approach. The Department of Systems Engineering and Computing Science continued to use a variety of teaching methods in the presentation of its courses and several members of the department continued to utilize the television-equipped classrooms. The department is also looking forward to the exchange of graduate courses with Stanford University via the communications technology satellite.

The School of Architecture employed the studio format of instruction which shapes the overall method of instruction. During 1975-76 major revisions were introduced in this area. Specifically, the studio component witnessed the introduction of a seminar format to teach design and a reduction in the use of tutorials. These changes were undertaken as part of the previously men-

tioned overall revision of the curriculum.

Again, as mentioned in an earlier section of this report, the teaching methodology employed by the members of faculty in the School of Industrial Design in the core of the third-year courses in the B.I.D. program (the industrial design studio projects 85.330* and 85.331) attempted to simulate the real situation in a design office with the principal objective being to assess the design and presentation skills of the students, as well as to introduce the coherence between function, technology, and form. The successful staging of this simulated situation resulted from detailed preparations by four faculty members during the month of August that was aimed at integrating the studio project with 85.310: *Mass-Production Technology* and 85.320: *Form and Colour Fundamentals*. It was on the basis of this undertaking that the school has decided to refine the methods and extend the principle to the fourth year of the B.I.D. program in 1976-77.

Students

At the undergraduate level, engineering students are recruited on a faculty rather than departmental basis because of the three-year common core program and in 1975-76 all departments participated in the high school liaison programs; however, a more concentrated effort will need to be made in the near future. At the graduate level Carleton's problems are similar to those felt by all other Canadian universities: the difficulty of attracting enough high-quality Canadian students into the program. This difficulty will be especially critical in 1977-78 when it is expected that the supply of foreign students will virtually dry up because of legislative changes made by the Ministry of Colleges and Universities. During the past academic year, as is usually the case, individual departments conducted their own additional recruitment at the graduate level, primarily by means of a wide circulation of brochures and publicity posters, both in Canada and in selected universities abroad.

Because of restrictions imposed by physical facilities, enrolment limitations were required at the first-year level in the Faculty of Engineering and the Schools of Architecture and Industrial Design.

With respect to enrolment policy and plans the Department of Civil Engineering sees thirty graduate students as the maximum number it could enrol in full-time studies. Numbers beyond this would strain faculty resources in attempting to maintain the level of involvement with the students that the department feels to be desirable at the graduate level.

Although no limit has been contemplated for the number of students in the senior year of the undergraduate program in civil engineering, there would be concern for the quality of instruction if senior-year courses with enrolment above about sixty students were to become the norm. At this level, the desire would be to split the course into two sections and the faculty resources



would consequently be strained. Adequate work space for students, particularly for senior project work and individual study, would also become a problem at this level. In fact, even with an anticipated enrolment of about forty-five for 1976-77, the adequacy of the space available can be questioned.

The Department of Mechanical and Aeronautical Engineering would like to see a maximum number of about thirty-five full-time graduate students, this number being fixed by thesis supervision limitations; it has not yet reached the number, and it will be increasingly difficult to do so in future. It does not see any need to limit the number of part-time graduate students. At the undergraduate level the question of numbers is under discussion at the faculty level. There is a definite limitation posed by both building and staffing facilities, a particular problem being the small number of large classrooms available.

The Department of Systems and Computing Science reported that while it will not be rejecting any highly qualified graduate applicants during the coming year, it will be unable to finance all applicants fully. As well,

restrictions upon the use of public funds for the support of foreign students means that several very highly qualified foreign students are unable to attend.

The Department of Civil Engineering reported having been blessed in 1975-76 with senior students of high calibre. Not a small part of the success of the department during this year was founded on the intelligence and motivation of these students. That a large number of them will continue with the department as graduate students next year is a mark of the department's confidence in the students' capabilities.

The small number of graduate students enrolled full-time during 1975-76 was a source of concern to the department. The low number was attributed primarily to the loss in continuity of faculty encountered during the previous year. There was also a continuing feeling that the department loses some good graduate students owing to the low level of financial support that the university is able to provide.

The Department of Systems and Computing Science was also extremely pleased with the calibre of applicants for graduate study, and is looking forward to a productive and exciting year in 1976-77. It was disappointed, however, that more of its own graduates will not be taking advantage of substantial scholarship support to pursue graduate studies immediately, and was also concerned that more master's students are not proceeding to the doctoral level in engineering. Employment opportunities and job satisfaction in the computer field are such that many otherwise qualified students may not perceive the benefits of a doctorate. The department intends to take what steps it can to convince students of the enhancement of their competence as engineers that results from doctoral studies. At the undergraduate level it is perhaps worth noting that three students constructed complete computers as their senior projects. The department is not sympathetic, therefore, to the view that standards are deteriorating.

There were no major changes reported regarding the calibre, attitude, and activities of the students in mechanical and aeronautical engineering relative to previous years. Both undergraduate and graduate students carried a heavy workload; nevertheless, there remained a good rapport between staff and students.

The quality of graduate students was quite satisfactory, but the level of support was felt to be a major drawback in attracting Canadian students into graduate work. Typical starting salaries for engineering graduates are almost \$12,000-\$13,000 and excellent students who have been awarded NRC scholarships have turned them down in recent years. Foreign students who formerly were able to enter Canada as landed immigrants found the level of support sufficiently attractive. However, with changes in immigration rules, they generally cannot come except as student visa holders and the level of support falls significantly because they cannot be paid from NRC grants. To maintain a viable graduate program,

one must have a reasonable number of students, but it is also of major importance that an adequate supply of teaching assistants be available. In the past few years this department has had about the right number of graduate students to support extensive commitment to the undergraduate core program; the future supply is a matter of considerable concern.

And, while little change in the overall calibre of students has occurred in electronics over the past few years, the department reported that a steady deterioration of background preparation and mathematical ability of students entering the second year has been observed over recent years.

The School of Architecture described the calibre of the students it has attracted via the selection process as being extremely high and, as a result, students placed very heavy demands on the staff. During this past year the School of Architecture Association of Students has been extremely active and has had a great deal of input into the deliberations of the Faculty Council and into all matter of organization in the school. The students are highly organized and have been very supportive as well as critical.

On the basis of the school's past experience and considering the results of the current run on admissions where the cut-off line on Grade 13 students is 83 percent, serious consideration must be given to improving resource allocation. The staff/student ratio is 1:15 and, despite the IRF (instructional resources formula), it should be brought back to at least 1:13 in line with the recommendations of the ASPG study. By a coincidence of circumstance, the university has the unique opportunity to make this school a centre of excellence, but this can only be achieved if the staff is given adequate support and the time to undertake the necessary preparation and research to be able to challenge adequately these very high calibre students.

Relations with the Community

The departments in the faculty, together with the Schools of Architecture and Industrial Design, maintain considerable involvement in the community via various committees, associations, community projects, and association with government and industrial laboratories.

In addition, the mechanical and aeronautical engineering department has always had a considerable interest in continuing education, and a number of courses for the non-university community have been organized. In 1975-76 a short course on gas turbine performance and design was undertaken; this course was originally designed to meet the needs of the Department of National Defence but is now becoming well known and attracted engineers from all parts of Canada and also from the United States. A course on terrain-vehicle systems analysis was arranged which already has a substantial enrolment, and a course on finite element methods in

stress analysis was also run. These courses enhanced the reputation of the university, and the course in finite element methods in stress analysis has directly resulted in the publication of a book. The name of Carleton University was also introduced to Cuba, where a course on compressors and pumps was given under the auspices of CIDA.

During the past year members of the faculty were also actively involved on the energy scene, both at the local and national levels. One was a member of the Reactor Safety Advisory Committee of the Atomic Energy Control Board, as well as examiner and consultant to the Porter Commission on Electrical Power Planning in Ontario. Another actively propounded the merits of railway electrification and made several appearances on TV and radio; a book, entitled *The Railway Game*, is in its final stages of publication.

The department made considerable contributions to the committees of a variety of technical and professional bodies and was well represented on the associate committees of the National Research Council.

The Department of Electronics has built up strong associations with government laboratories and industrial firms which are of great benefit in all aspects of its work. The graduate courses offered continued to be a direct service to the community in addition to constituting an interrelated range of topics for the M.Eng. and Ph.D. programs. Most of the department's research program has been pursued in association with outside laboratories and firms. By this means faculty members ensure that they are working on problems of practical relevance and topical interest. The Applied Instrumentation Laboratory operates entirely on this basis. It is expected that the strength of this association will continue to increase, and that research funding will be drawn increasingly from outside sources via contracts.

The Department of Systems Engineering and Computing Science interacted with the Ottawa community in a variety of ways. One of its strongest links was through the hundred or so part-time students, most of them professional engineers or practising computer scientists, who were enrolled in programs in the department. This group was employed in a wide cross-section of government and industry within the Ottawa area. In addition, adjunct professors and sessional lecturers were drawn from senior members of the Ottawa technological community. The department's research and development program, together with activities in consulting and contract research, linked it to many institutions, amongst them Bell Northern Research Laboratories, Stanford University and the National Aeronautics and Space Administration in the United States, the Department of Communications, National Research Council, the Canadian Police Information Centre, the St. Lawrence Seaway Authority, the Ontario Department of Education, and the Ministry of State for Urban Affairs. Through presentation of papers embodying the results of research and development,

members of the department were in contact with the world-wide technological community. In addition, members of the department acted on the executives of several professional bodies.

The interaction of the School of Industrial Design with the community at large was not so much of a local nature as it took place mainly on a national and international scale. Officially, these contacts were channelled through — the Association of Canadian Industrial Designers of which the director was a board member and the faculty members are professional members; the Office of Design of the Department of Industry, Trade and Commerce and through the National Design Council; the Industrial Designers Society of America, of which the director was an associate member; the International Council of Societies of Industrial Design in which the director served as a member of its working group on education and a member of faculty served as a member of the working group for underdeveloped countries; and memberships of faculty members in various national organizations or committees of such organizations, for example, the Committee on Linear Measurements of the Canadian Standards Association, the Committee on Sports Safety Equipment of the Canadian Standards Association, and the Seminars Committee of the Society of Plastics Industries.

In addition, ad hoc contacts were made during 1975-76 with the Canadian National Institute for the Blind, the Canadian Consumers Association, the Ottawa March of Dimes Ability Centre, the Ottawa and District Association for the Mentally Retarded, and several Canadian industries, the latter for the organization of the industrial practice internship program of the school. A continuous contact has been developed with the Zinc Institute and the Society of Plastic Industries. The school also participated in a number of national and international events on industrial design education in 1975-76.

Similarly, the School of Architecture interacted with the community on a number of levels. Most directly it provided course work in community development in which students actively involved themselves with community groups studying issues that are affecting those groups in the local area, for example, the Sandy Hill Ratepayers' Association and the Centre Town Ratepayers' Association. In addition, the school ran a forum at least once a week in "the Pit" in the Architecture Building in which speakers from a wide range of fields were invited to present projects and ideas to an audience composed of students, the general public, and the profession.

All the school's studio instructors were concerned with community interaction and almost every problem set in this school (eight or ten major problems per term) was chosen from projects actively under consideration in the regional community. In support of this the real client was invited to set out the problem and to participate in the criticisms and reviews of the student project solutions. With the addition of professional experts, such as

planning authorities and regulatory authorities, an active dialogue was sought and maintained.

An enormous amount of help was received from major government departments such as the Division of Building Research of the National Research Council, the Central Mortgage and Housing Corporation, the National Capital Commission, and the City Planning Department, all of which provided technical data, maps, and background information. These authorities responded creatively to the opportunity of having a student group examine a current problem with the idea of generating alternatives. We have only begun to explore the full potential of this device.

Other interaction occurred on an individual basis, principally as a result of consulting or less professional extracurricular activities.



Faculty of Graduate Studies and Research

Dean's Report

*Il faut vouloir pour se tenir debout;
mais pour tomber ce n'est pas nécessaire;
la pesanteur suffit. Alain*

The 1975-76 academic year at Carleton was the year of the great leap forward on the graduate studies front and a year of reflection on the research front.

After the 1974 operational rearrangement in the administration of graduate studies, the faculty was ready for the great leap forward. This was not only a matter of raising substantially the number of full-time graduate students — although we reached the thousand mark — but also a matter of initiating some new programs (anthropology, journalism, information and systems science) and of launching our refurbished program in public administration. This growth in the size of Carleton's graduate school and the development of these new programs in a period characterized by a plateau in the overall Canadian graduate enterprise corresponded to a maturation stage in the life cycle of the institution.

The same forces led us to reflect on the research effort and the scholarship produced by Carleton's personnel. Beginning not only with the information accumulated over the previous year on the nature of work in progress and from the overview provided by *Research and Studies 1975*, but also from what we had been learning about what was going on at Carleton as a result of the explicit research-advisory role the dean's office had taken during 1974-75, it became possible to extend the faculty's role from the simple passive advisory function which had characterized much of its earlier concern to a more active role as "broker" between researchers at Carleton and external agencies, as facilitator for the emergence of organized research units, and as *animateur*, on a modest scale, of the research process.

All this occurred at a time when the environment for universities was turbulent and the temptation to indulge in dynamic conservatism was very strong. Our strategy remained, however, to evolve plans for a steady state in our graduate enterprise at about a thousand students full-time (and probably as many part-time), and to prepare the blueprint for a rearrangement of our research administration in ways which would promote an aggrandizement of our research enterprise and provide maximum benefits to the Carleton community with a minimum of administrative inconvenience.

The increase in our graduate enrolment came at a very crucial time, for 1975-76 was the year when the ministry decided to divorce funding from enrolments for a few years. The fact that we reached our present level a bit earlier than we had first anticipated enabled Carleton to obtain a larger share of the graduate funding in the pro-

vince and to establish a claim to a maintenance of this share for a few years at least.

However, to stay at this level, Carleton will have to evolve a suitable strategy to ensure *externally* the effective marketing of its programs. While it is perfectly understandable that students may decide to go elsewhere in search of a more enriching graduate experience, it is intolerable that they should bypass a chance to study at Carleton only because they do not know what is going on here. But, in order to be able to publicize in good conscience the various programs we have at the graduate level, it is essential that *internally* we provide graduate instruction of the highest quality and that we develop mechanisms to ensure that students choosing to study at Carleton will indeed find this academic environment as rich as anticipated.

To that end, the faculty began in 1975-76 a series of internal academic audits. These were intended to supplement the external appraisals and to help us see clearly how our programs could be revised and improved. These internal audits, using scholars of international repute to review our existing programs, forced departments, institutes, and schools to reflect on their current activities, offerings, and practices and has occasioned the development of higher quality practices which were exportable to other units.

Much of the discussions with departments, institutes, and schools carried on during the 1975-76 academic year resulted not only from the academic program audits, but also from the thorough, annual, academic performance audit of each student file conducted by the dean's office, and these will have their echoes in the next few years. New procedures to monitor the thesis process, a more sharply defined role and form of the comprehensive examinations, an upgrading of the standards of admission to and of promotion within our programs, a closer monitoring of the progress of each student, more carefully planned enrolment levels, all of these are becoming standard practice in departments, institutes, and schools.

The new circumstances have forced the university to abandon empty hopes of expanding graduate work in all directions. We must now ask ourselves in what fields have we demonstrated excellence? In what areas can we not afford *not* to excel? The decision to initiate new programs or to seek appraisal for planned ones — in Canadian literature, for instance — is the result of hard trade-offs between the lack of new funds and the necessity for Carleton's plans to unfold according to imperatives which go beyond immediate demand. All this represents a reassertion of our belief that academic priorities must take precedence over the dictates of accountants.

Periods of turbulence trigger co-operation and collaboration between dissimilar organizations whose fates are fundamentally positively correlated. After too long a period of somewhat hostile coexistence with the University of Ottawa, 1975-76 provided the opportunity for Carleton to develop a truly joint program in public administration with its sister university. Many plans for full co-operation in

other areas are also under active discussion. In the same spirit, many sectors within the university have been searching for ways to effect new forms of useful co-operation within the existing financial and academic constraints. Art history, music, commerce, and law all share at the present time in the graduate enterprise through the auspices of host programs according to a formula of collaboration initiated by the Institute of Canadian Studies and emulated more recently by other schools and institutes. These stated efforts are the forerunners of a more closely integrated and a more creatively aggregated university. The new joint venture of the Department of Mathematics and of the Department of Systems Engineering and Computing Science is another example of this movement.

Carleton has also come of age on the research front. The amount of sponsored research passed the \$3 million mark in 1975-76. Since much of this sponsored research is matched by a substantial investment in time by university personnel and major use of existing university facilities, it is plausible to talk about a research enterprise of some \$6 or \$7 million, much of it the result of the private energies of individuals and groups at the university. The role of the Faculty of Graduate Studies and Research has been to try to facilitate the activities of these researchers and scholars by providing better information, some seed money for promising projects, some help for seasoned researchers in difficulties, and much advice and encouragement for the creation of research collectives.

This has been a year when our attempts to stimulate research collectives met with spectacular results. While some older and better-established units like the Wired City Laboratories and the Energy Research Group continued to prosper, many new organized research units have emerged all over the university: the Applied Instrumentation Laboratories, the Renaissance Centre, the Jurisprudence Centre, the Emergency Communication Research Unit, the Ottawa Valley Regional Studies, the Centre for Social Welfare Studies, the Architectural Research Group, to name but a few.

Most important of all, perhaps, is the emergence of the Paterson Centre, the cross-university umbrella organization which should play a dramatic role in the development of research at Carleton over the next decade. At present, the centre is a measure of our hopes and an instrument to help Carleton take full advantage of its possibilities as a plausible national university in the nation's capital.

The drying up of research monies had led some to think that the future prospects are bleak for such institutes and research units. The faculty disagrees. These units are fundamentally composed of interested and productive scholars and, while money is not unimportant, it is in a sense secondary to their spirit of inquiry and their commitment to these joint ventures. It is for this reason that we have deliberately encouraged the formation and the formalization of these groups and units. They serve as vehicles for a new form of integration overcoming the excessive special-

ization and division which has emerged from the traditional departmental structures. If ad hoc arrangements proved expedient at first, the very success of this formula calls for overall policies which could apply to all of them and would encourage more effectively their unique contributions. This is one of the items on the agenda for 1976-77.

But this institutionally organized research does not constitute all the research reality at Carleton. The individuals who activate this research enterprise are the key to the whole process and they deserve financial assistance on an enlarged scale and recognition for their contribution. Moreover, if it is to be made into a yet more creative and a more exciting place to live in for scholars and scientists, the university must find the means to guarantee that the flow of new ideas and new people will continue.

Budgetary constraints would appear to deny any possibility of making progress in this direction, but such is not the case. The 1975-76 academic year has allowed us to experiment on a rather modest scale with the idea of university research professorships: the faculty was able to buy from departments some time for researchers at crucial points in the production of important work. We hope to move further in this direction in the coming years.

Given the extent of our use of post-doctoral fellows, post-doctorate assistants; visiting scholars, and research associates, there is a need for giving them an explicit home in our research enterprise and also in the university. In the same manner, there is a need to integrate fully the contractual work done by university faculty members into their overall university work. This calls for the development of new policies or, at least, the formalization of existing practices. Much of the result of our reflections and discussions on these matters in 1975-76 should find its expression in the rearrangements planned for 1976-77.

But the new levels of graduate enrolments will not be maintained and the new developments on the research front will not evolve satisfactorily unless there is a renewed sense that life at the university offers to academics a unique opportunity to spend much of their time learning in the company of the brightest and most stimulating members of the community, and that this privilege carries with it an important responsibility—the responsibility for each member of the community not only to develop his or her talents more fully and to "study the most important problems they think they can solve" (Medawar), but also to recognize the importance of the rules of reciprocity in academe. Those who make demands on the academy but preach the dominium of *quid pro quo* must come to recognize the *price of membership*. The dues are not payable in money, but in terms of intellectual effort, informed debates, sympathy, tolerance, loyalty, and mutual trust. To those who might say that it is absurd to expect people to promote standards so exacting or to obey them, I can only say with Geoffrey Vickers "I am not asserting that it is possible; only that it is necessary."

Gilles Paquet

Report of the Vice-President (Academic)

Introduction

In addition to the considerable number and range of activities outlined in this report's departmental descriptions, the 1975-76 undertakings of the academic sector of the university could be said to have been dominated by collective bargaining, several major academic program and related proposals, enrolment increases, and the continuing concerns related to the shortage of space.

Negotiations for the first collective agreement with the academic staff association (CUASA) were conducted during the period July to November and agreement reached on December 11, 1975. It still remains to be seen whether and in what way a faculty union and the advent of collective bargaining will either strengthen or weaken the academic life of the university.

During the 1975-76 academic year, Senate granted approval to three program proposals, one of the most notable being the Ph.D. in Canadian Literature. Also, by June of 1976 the undergraduate program in Canadian studies had completed its first year of operating at St. Patrick's College. And, in connection with program planning, a major report on the future of continuing education at the university was compiled and presented to the various planning bodies of the faculties and divisions as well as to Senate's Academic Planning Committee.

The review of all academic departments was completed by the Senate Academic Planning Committee during the 1975-76 academic year and during the summer months the committee prepared its final report on the findings of the review. The report, as planned, has been circulated to all faculty/divisional planning bodies for comment in preparation for its receipt by Senate.

The 1975-76 academic year also witnessed significant enrolment increases, particularly at the graduate level. And, as was expected, the university continued to face acute space shortages, especially in the library, as the ministry continued its freeze on building.

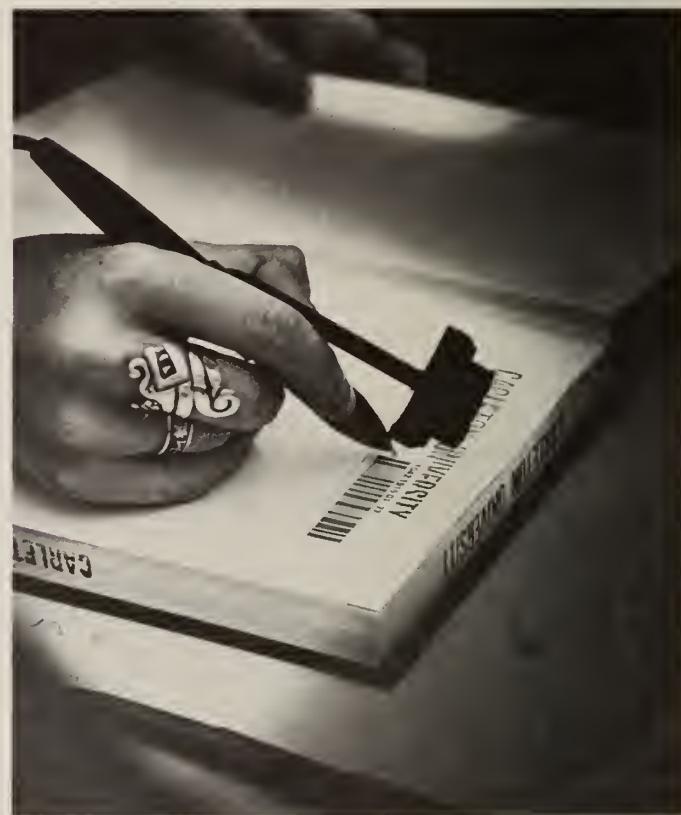
It is within this overall context that the following departmental activities have been described.

University Library

For the MacOdrum Library as for other sectors of the university, the 1975-76 academic year will probably become known as the "year of the unions". The first contract with the Carleton University Academic Staff Association was concluded before Christmas and, while the initial result of the contract was that the management of the library was a much more time-consuming and stiffer operation, it is still too early to evaluate the effect that unionization

will have on the library's provision of services.

One result of the contract was a change in the committee structure of the library. A new committee, the University Library Committee, was formed to give advice on general library matters to the university librarian, and principal among the initial tasks of the committee was the formulation, in company with the Peer Evaluation Committee, of procedures and rules relating to the appointment, promotion, and confirmation of professional library employees.



Library expenditures during the year formed 8.13 percent of the university's operating budget, as compared with 9.34 percent in the previous year. This decrease resulted from the limitation of total funds and the pressures to effect some redistribution, and brought about a reduction in the book fund as well as in services. The relative purchasing power of the book fund dropped to less than half of what it was five years ago, and while it is hard to estimate precisely the effect of this diminution of purchasing power on overall library acquisitions, the main thrust has been to decrease the proportion of the book fund available for second-hand and out-of-print material as well as backruns of periodicals.

The need to reduce the total library budget, coupled with the need to find money for salary increases, led also to a reduction in personnel of 18 percent from 1974-75; for the most part this was achieved through attrition. An

additional severe reduction in the part-time personnel budget meant, however, that hours and services became inflexible and work accumulation apparent. The reduced hours and services mainly affected evening and weekend hours and thus were felt most severely by part-time students.

Development was also brought to a virtual standstill by budgetary constraints — a fact of life that is felt most acutely in technical areas. Many library services now on the market, which are potentially cost-effective, require internal development before implementation. Reorganization and retraining is a necessary part of development as is the adoption of new technologies, but in the present budgetary situation the library is unable to make this kind of investment. One area in which such development was able to be made, however, was the provision of on-line searching of a number of data bases in science and technology. A terminal in the Science/Engineering Division was connected to CISTI's CAN/OLE (Canadian on-line enquiry) service. Both faculty and graduate students made fairly heavy use of this service.

Shortage of space again meant the rearrangement of parts of the collection. Microforms were split among the divisions, special collections and the archives were merged to save staff, and the School of Social Work's collection was integrated with the main collection.

University Registrar's Office

The University Registrar's Office is directly responsible for admissions, high school liaison, calendar and admission publications, student records maintenance, examination administration, and class scheduling. Through the Registrarial Co-ordinating Committee it has a secondary responsibility for co-ordinating all registrarial activities at the university.

During the 1975-76 academic year the office was pleased to respond to inquiries by two administrative task forces, one in each of the major areas of admissions and records. These task forces reached positive conclusions about the office's activities, recognized the close interdependency between the office and the academic jurisdictions, and noted the need for more support staff.

One of the office's chief concerns throughout the year was that of meeting increasing demands with limited resources. A feature of registrarial work is that these demands are not necessarily related to the most visible indicators. For instance, the Central Academic Records Service (CARS) maintained 24,491 active student records during 1975-76, an increase of 25 percent from the 19,622 maintained in the previous year, although the increase in actual reported enrolments was far less. In admissions, although the total applications for September, 1976, were about the same as for the previous year, admitted students increased by 12 percent and upper year admissions, which require considerable extra attention in processing, increased 60 percent.

The response to this heavier load has been mainly the

greater use of computing resources. In September, 1975, CARS undertook a data base approach to handling student records. The new approach provides far greater access to the information available. Computerized files for class and room schedules are also under development. The use of on-line facilities in the Admissions Office greatly increased that office's control of the 12,400 applications that are processed annually.

High school liaison activities were also unusually heavy during the year, the main feature being Carleton's hosting of the Dialogue conference, an annual gathering of some 500 high school guidance and university liaison people from Ontario and Quebec.

Office of Continuing Education

Increase in interest in part-time studies at Carleton continued to grow during 1975-76. There was a 23 percent growth in special student registration over the previous winter session, while the extension (non-credit) program experienced a 13 percent increase in the number of students enrolled in its programs.

One of the areas in which future growth will probably be strongest is the off-campus program. Strong registration was experienced in the four off-campus courses offered during the 1975-76 winter session, and all expectations were exceeded for the Religion 120 course offered in Carleton Place during the 1976 summer session with a registration of over 100 students.

Primarily through the efforts of the Faculty of Arts, plans have been made to increase the number of off-campus courses to thirteen for the winter session of 1976-77, with courses being offered for the first time in Gloucester Township, Rockcliffe Park, Bell's Corners, and Arnprior. Such off-campus courses have in the past proved to be successful in developing Carleton's relationships with surrounding communities, as well as making university studies possible for persons who otherwise may not have attended.

Another program that saw considerable expansion was the Study Skills course offered by the office. Originally designed to help students who had not participated in formal education for a number of years to orient themselves to the expectations and requirements of a university course, the program proved to be very popular with a wide cross-section of students, both part-time and full-time. In response to this demand, the program was expanded so that it could accommodate all interested persons in the university. One example of this expansion was the section of the course which was recently offered to off-campus students in Carleton Place.

On campus, the registration-by-mail service for special students increased in popularity during its second year of operation with an increase of 30 percent in the number of students utilizing this method of enrolment. With the large registration of special students that was experienced in September, registration by mail, in addition to providing

a very helpful service to the students, lessened the high demand on registration facilities during the September peak periods. One result of this increase in special students was the very busy year experienced by the office's counselling service.

With the healthy growth in enrolment in the non-credit program, the primary goal for the Extension Division in the last year was that of consolidation. Accordingly, emphasis was placed on the development of courses which would deal with suitable university subject matter and would be conducted at an appropriate academic level.

Carleton's programs which are offered in co-operation with various professional organizations continued to be very well received. The most significant increase in student participation in this area was witnessed in the Institute of Canadian Bankers (ICB) program whose students enrol in both Carleton credit and non-credit courses. The 107 percent increase in the enrolment of ICB students at Carleton was, according to ICB statistics, the largest growth experienced by any of the fourteen Ontario universities participating in the program.

During the past year arrangements similar to those with the ICB were also made with the Insurance Institute of Canada. Additionally, negotiations have been taking place with the Staff Development Branch of the Public Service Commission in order to determine the possibility of presenting courses for public service employees.

Another major priority of the office in the last year was in the area of public relations. In an attempt to create greater community awareness of the wide variety of part-time study opportunities available at Carleton, as well as to identify other potential academic services which might prove beneficial, much time was spent meeting and/or addressing community groups and organizations.

During the past year the office worked closely with officials of TV Ontario in order to develop non-credit courses which could be complemented by presentations on the Ontario educational television network. Two non-credit experiences have been planned as a result of this liaison: a series of field trips offered by the geology department, and a course offered by the chemistry department to introduce the general public to the major issues in chemistry that are affecting everyday life. If these non-credit projects prove to be successful, attention will be given to the possibility of some of Carleton's departments or schools offering a credit course which can be integrated with TV Ontario programming.

In general, part-time studies continued to be a particularly important aspect of Carleton's activities. The university has always been very accessible to the community because of the large number of courses available both during the day and evening and through the opportunities presented by the special student and the mature matriculant categories. Recently instituted programs, such as the off-campus courses, free tuition for senior citizens, and the Challenge for Credit policy, represent attempts to ensure that Carleton responds appropriately to the ever increas-

ing public interest in continuing education, as well as to the unique needs of its constituency.

Instructional Development

The activities of the Senate Committee on Instructional Development and the Office of Instructional Development involved not only the administering of internal grants in aid of innovation in teaching and learning but also, and more importantly, the co-ordination and presentation of various workshops and seminars designed to inform and involve faculty, graduate teaching students, instructors, staff, and students in non-traditional modes and methods of instruction. Such special workshops included "Learning with Case Histories" and "Simulation Game Starpower", while a seminar series presented a variety of faculty, staff and student discussions on such subjects as "Computer Assisted Learning", "Evaluation", "Films on Learning and Teaching", and "An Integrated Approach to Teaching".

An additional series of six workshops on teaching methods and related matters, the 1976 Instructional Development Summer Institute, was co-ordinated and offered during the month of June with the assistance of a \$6,000 grant from the Ontario Universities' Program for Instructional Development. Each workshop was a two-day venture and included the active involvement of participants in "Simulation Design Techniques", "Remedial Learning", "Curriculum Design", "The Role of the Laboratory", "Small Group and Lecture Methods", and "Evaluation of Student Performance".

Other items on the agenda of the Senate committee and its office included the co-ordination of the various learning skill programs offered throughout the university, and the compilation and production of a selective guide to resource centres at Carleton, *Resources for Courses*, as well as the *Annotated Bibliography of Print Materials on Instructional Development and Related Matters*.



Instructional Aids

The 1975-76 academic year was the busiest and most successful to date. Operating on the same basic administrative structure as the previous year, the office handled more audio-visual bookings than ever before, responded to more requests and to a much wider range of media production than experienced in previous years, and provided more flexible and better facilities for theatre users.

Both full- and part-time staff changes have been lessened as is evidenced by the reduction in turnover from 50 percent to 25 percent over the previous year. Minor improvements were also made in the media production area in the interest of providing more time for production advisers to consult with faculty in the planning and preparation stages of academic programs. The result of having production assistants take over operational duties normally performed by production advisers has been a more efficient system of working with faculty and of producing better quality media programs.

In addition to producing its own material, the office purchased approximately thirty films and video tapes. Although most of these were joint purchases with other university departments, the material is maintained in Instructional Aids and is available for general university use. Because of this service, one immediate need is a better system of cataloguing film and video tape material and of informing faculty and students of the service. This system will be one of the major projects for 1976-77. Also, provided the cost is reasonable, a computerized system for hardware and software bookings will be examined.

An increased liaison with the Ontario Educational Communications Authority (TV Ontario) has resulted not only in the purchase of material from them, but also the sale by the office of their video tapes for inclusion in the VIPS (Video Tape Program Service) distribution services. In the office's own production area, more professional service is now provided in the preparation of overhead transparencies, despite the modest amount of equipment and graphics material available. The office is somewhat reluctant to publicize this service, however, since it would be unable to bear the increased workload, with a current situation of working full capacity not only during the academic year but also during the remaining four months of the year.

Total bookings reached 8,105 as compared with 6,626 for 1974-75. In addition to these services, the office permanently installed twelve screens and overhead projectors with stands in classrooms where the equipment would be required at least once daily. This heavy workload has, of course, affected the maintenance section and, as in other sections of the office, this area is operating at maximum workload.

The most pressing needs of the department lie in the areas of staff morale and workloads and equipment maintenance and replacement.

Student Services

While there were no spectacular developments in the area of student services, there was growth and development in all services during the 1975-76 academic year.

Information Carleton was established in conjunction with the Carleton University Students' Association (CUSA) and with the co-operation of the Information Office. The main purpose of this service is to respond to inquiries made by persons within and outside the university; it is staffed by students and members of staff from the Office of the Dean of Student Services (ODSS) and other offices within the university.

A report on campus security was submitted to the vice-president (administration) with a similar report having been made by the ombudsman. These reports, occasioned by a growing concern on the part of members of the university community with regard to security on campus, resulted in the establishment of the Security Advisory Committee.

A task force on orientation for new students was also established in conjunction with CUSA. The purpose of the force was to review past orientation programs and to recommend changes which would make the university more responsive to the needs of incoming students. Following the work of the task force, visits were made to high schools in an attempt to learn from prospective university students what their anticipated needs were. One significant development resulting from these deliberations was an ongoing orientation program during the summer months. Greater efforts were also made during the year to respond to the needs of overseas students.

Due to the advantages the physical plant of the university offers the physically handicapped, more students with such limitations are being attracted to Carleton. As a consequence, ODSS worked with these students in bringing about improvements and other offices and departments, such as Housing and Food Services, Physical Plant, and Health Services, were also responsive.

A new co-ordinator of student services and a reduction of staff at St. Patrick's College had a significant impact on the programs offered with a shift of emphasis but no evidence of loss of quality. The office continued to promote community-oriented volunteer programs and athletic and cultural activities received the usual attention. Attempts were made to organize special activities for the adult student. Also, for the first time the co-ordinator became actively involved in advertising the programs offered at the college, working closely with the High School Liaison Office in the promotion of the college.

In the Department of Physical Recreation and Athletics all programs experienced substantial growth in enrolment; several were oversubscribed and people had to be turned away due to limitations of space, time, and staff.

The Users Committee, established the previous year, submitted its report to the Athletic Board and one immediate result was the approval for the completion of five,

all-weather tennis courts. A Wintario grant was sought and obtained to fund the project partially. The use made of these courts since their completion has more than justified the decision and made evident that such a facility was long overdue. It appears that they should generate sufficient income to cover their maintenance and contribute to the overhead cost of the department.

The athletic department, as a result of the Users Committee deliberations, developed a five-year financial forecast which should facilitate long-range planning. This forecast has made evident the fact that the department could not afford to re-introduce the intercollegiate sports which were dropped two years ago without deficit financing.

Growth and expansion possibly best describes what took place within Counselling and Health Services. Lack of adequate space had hampered the services for some time; this situation was greatly improved by obtaining space for counselling in St. Patrick's College. Although the physical separation of the two services has some drawbacks, the benefits gained by the additional space outweigh these by far.

In counselling increased emphasis has been placed on programs concentrating on educational and career counselling. This was marked in 1975-76 by an expanded testing program and a more complete career information library. There was, however, a noticeable expansion of psychiatric services which now has two full-time psychiatrists and one half-time. Also, arrangements were made this year with the Department of Psychiatry, Faculty of Medicine of the University of Ottawa, for a fourth-year psychiatric resident to join the staff on a full-time basis; this will be an annual appointment. This expansion is in response to a growing need which is demonstrated by the fact that 257 persons were seen for a total of 2,207 visits during the year. The most common problems were depression and anxiety. Drug problems were much less evident but alcholic consumption was of increasing concern, especially in relation to dependence and in association with incidents of violence.

Medical services were also much in demand; the total number of out-patient visits was 22,081. There was the usual variety of diseases for the student age group with a slight increase in the number of cases of influenza and German measles. Health Services continued to expand its offerings in the area of consultation, education, and preventative programs. Unfortunately, such development is hampered by limitations on funds and staff.

The work load of the Awards Office is evidenced by the following figures: for Ontario alone 3,066 applications were processed and 2,567 loans, 1,879 grants, and 146 bursaries were awarded students from Ontario by provincial programs; the Province of Quebec approved loans to 226 students and bursaries to 106; from other provinces 205 students received financial assistance through provincial loans/bursaries or the Canadian Student Loan Program; from funds provided by Carleton University, 360 under-

graduates were awarded scholarships and 518 received bursaries; and 767 loans were approved out of loan funds administered by the university.

Computing Services

The 1975-76 academic year will long be remembered as the one in which Xerox went out of the computer business. After the initial shock in August, Computing Services took careful stock of the situation and decided that it was best not to make any hasty decisions but to see what developed in terms of a possible takeover. In the meantime, contracts were signed with Xerox binding them to maintenance of the system until 1980. By October it was clear that Honeywell was going to take over the maintenance of the Xerox-installed computer base, as well as the newly signed agreements. Additional support was committed by Honeywell and the adaptation of the company's peripherals to Sigma mainframes has been encouraging with respect to the university potential for computer growth. Indeed, the new operating system development program undertaken by Honeywell suggests that a growth path may exist within the Honeywell camp when the university has exhausted the capacity of its current system.

A number of significant but less traumatic internal system changes were accomplished during the year by the Systems and Operations Group. A private asynchronous computer exchange (PACX) was installed in order to increase the utilization of the computer time-sharing ports in-house and to alleviate congestion on the dial-up ports used by most faculty members. This, along with a major communications gear configuration change, has dramatically increased the number of useful ports on the system. The communications gear reconfiguration also permitted all the Decwriter LA36 terminals purchased to replace the aging Olivetti terminals to operate at a 300 percent increase in speed.

In order to enhance further the range of service available to users, negotiations were carried on with the University of Ottawa during April and May, 1976, regarding the sharing of computer resources between the two institutions. It was agreed that sharing would be actively pursued and that a remote batch link would be made from the Loeb Building at Carleton to the IBM 360 at Ottawa university. The University of Ottawa is making available a port on the 360 that will be available to Carleton users only.

During the past year the Administrative Data Processing Group has implemented a number of new systems and made major changes to existing systems. The new systems implemented were: an admission system, a book-store system, an equipment inventory system for the Faculty of Engineering, and a graduation summary system for use by the Faculty of Arts. A new data base was designed for the student records system and this was implemented in time for the fall (1975) registration.



The advent of unionization by CUASA and CUSSA (Carleton University Support Staff Association) and the necessity for the Anti-Inflation Board submissions resulted in much extra work for the group and necessitated some major changes to the payroll and personnel systems. In addition, changes in the manner that basic income units are calculated also resulted in major reprogramming. Some major changes were also made to the library machine readable shelf list to achieve optimum use of the computer and provide a better service for the library.

Development work has been underway on a new financial reporting system which is due to be implemented in May, 1977. This system will embody in one data base the payroll, personnel, accounts payable and receivable, and general ledger files to facilitate such functions as budget projection and establishment control as well as the standard functions such as payroll and accounts payable.

Thus the 1975-76 year was a time of significant change in the hardware configuration and software environment. The Honeywell takeover has been accomplished relatively smoothly and it is anticipated that the coming year will be one of increased capacity, stability, and reliability.

G.R. Love

Report of the Vice-President (Administration)

The 1975-76 fiscal year began on a rather pessimistic note due to the financial difficulties which the university was anticipating. These difficulties were caused by a combination of enrolment declines and a desire on the part of the Ontario government to put a ceiling on increasing educational costs.

Fortunately, our final enrolment for the year was 744 full-time equivalent students higher than had been projected, resulting in increased tuition fees of more than \$400,000.

Further income increases amounting to \$120,000 were realized through the Ontario government's decision to increase the value of the basic income unit by \$3.00 more than we had expected and through our success in obtaining a rebate for sewage surcharges which we had been assessed by the City of Ottawa during the past four years.

Because of these unanticipated income increases, and through the co-operation and efforts of all staff in reducing operating costs, we were able to convert a budgeted deficit of some \$400,000 into a surplus of \$452,000.

Although this improvement in our financial position provided welcome relief for this year, for the most part these income improvements are non-recurring and we are still faced with the need to decrease expenses even further than we had in the past. Furthermore, we have been advised by the Ministry of Colleges and Universities that our special supplementary grant which amounted to \$1,450,000 in 1975-76 will no longer be available to us, and that future financing of graduate students will be maintained at the 1975-76 level, giving no consideration to future expansion.

Both faculty (CUASA) and support staff (CUSSA) became certified bargaining units during the year, resulting in a very dramatic shift in the percentage of staff unionized. Previously there were four unions on campus representing 160 staff members or 9 percent of our total full-time staff. With the formation of CUASA and CUSSA, 1,470 staff members (83 percent) are now represented by unions.

The negotiating process has created the need for information and heavy new demands on the time of administrative staff. In the development of first collective agreements these new requirements have utilized a considerable share of our management resources. These added requirements were a major consideration in the decision to reorganize and upgrade our Personnel Office.

Perhaps the most serious external influence on our operations in this year was the introduction of the anti-inflation program in October, 1975. This came shortly before our first collective agreement with CUASA was signed. Because of the many uncertainties about the regulations which existed at the time of the introduction of the Anti-Inflation Board, very considerable effort was expended in preparing a submission to the board on the CUASA settlement.



Canada's acceptance of the metric system has also affected operation. To cope with this significant change, the Co-ordinating Group for Metric Conversion was formed to assess the affects of this change on the university and to plan and organize its implementation.

As mentioned earlier, the staff has co-operated and contributed extensively to the cost reductions which have been effected. A significant example of these savings can be seen in the activities of our Physical Plant Department where continued efforts are being carried on in energy conservation programs. Control systems have been developed which have considerably reduced energy consumption through such action as turning off air-conditioning and circulation systems when buildings are not being used and removing lights where it was found they were not really required. Furthermore, we have embarked on a program of equipping offices with 32-watt hanging lamps which replace up to ten fluorescent tubes in each office. Along with other similar revisions, these programs have brought about savings of approximately \$600,000 per year so far. While this sort of change has not been accomplished without some resistance, we expect even further savings in the future and must continue to take perhaps even more drastic measures.

Other departments have developed cost savings measures as well. Graphic Services, Technical Services, Purchasing and Communications Departments have all reduced costs. The Bookstore has developed a new system utilizing our computer to improve ordering and inventory controls and thus the service provided to its users.

Finally, the Finance Office has devoted considerable effort towards the development of a new computerized general ledger system which will make the financial reports to all university departments more useful, and provide better cost controls. It is expected that this new system will be put into effect during the 1977-78 fiscal year.

Our Development Office has continued to play a valuable role in filling the need to obtain much needed finan-

cial support for students, research, and capital improvements. During the past year the university received approximately \$944,000 in gifts and grants of these kinds.

Phase II of Carleton's five-year campaign has begun and to date we have received 3,567 gifts and pledges totaling over \$2.1 million. The total objective is \$5.5 million over the five years 1974 through 1979.

The year 1975-76 was one of change and reorganization for the Information Office. While staff numbers remained static, new duties and responsibilities were assumed to accommodate increased requirements, particularly in the field of publications relating to alumni, development and academic programs. As a result, the official university tabloid, *This Week Times Two*, adopted a once-weekly publishing schedule with a name change to *This Week at Carleton* occurring in September.

Publishing responsibility for the Development Office and Alumni Department quarterlies, *Carleton University News* and *Carleton Alumni News*, has been transferred to the Information Office.

A good start was made on a new program of undergraduate discipline brochures intended to complement the High School Liaison Office's information program for high school students considering university as well as to respond to other requests for information about specific undergraduate disciplines offered at Carleton. In collaboration with Graphic Services, the Information Office also produced the 1974-75 university report, the 1975-76 data book, and *Research and Studies 1975* along with over 100 other publications ranging from pamphlets and flyers on programs and lectures to the president's invitations, from open house and conference literature to posters, handbooks, and specific campus information for students.

During the year the Information Resource Centre was redesigned and expanded to give the university community a more efficient information retrieval system, while the Carleton University Speakers Bureau filled over 100 requests for speakers who travelled as far afield as Deep River, Iroquois, and Toronto.

The year ended on a somewhat sad note when we were advised that Miss Muriel Cahill, finance officer of St. Patrick's College, intended to retire on June 30, 1976. Miss Cahill had joined St. Patrick's College in 1930 and during her long career she has played an important role in the business life of the college. There probably are no graduates of St. Pat's who do not know Miss Cahill personally. She will be greatly missed and we wish her a happy retirement.

A.B. Larose

Deans, Directors and Chairmen 1975-76

Faculty of Arts

Dean	L.M. Read		
Art History, Department of	Chairman	D.G. Burnett	
Canadian Studies, Institute of	Director	A.D. Dunton	
Classics, Department of	Chairman	D.G. Beer	
Comparative Literature, Committee on	Chairman	Eva Kushner	
English, Department of	Chairman	James Steele	
French, Department of	Chairman	Armand Roth	
German, Department of	Chairman	R.D. Gould	
History, Department of	Chairman	P.J. King	
Italian, Department of	Chairman	R.L. Jackson	
Journalism, School of	Director	G.S. Adam	
Linguistics, Department of	Chairman	W.G. Cowan	
Music, Department of	Chairman	John Churchill	
Philosophy, Department of	Chairman	J.W. Leyden	
Religion, Department of	Chairman	S.G. Wilson	
Russian, Department of	Chairman (acting)	G.R. Barratt	
Spanish, Department of	Chairman	R.L. Jackson	

Faculty of Social Sciences

Dean	R.A. Wendt		
Commerce, School of	Director	J.B. Waugh	
Economics, Department of	Chairman	N.H. Lithwick	
Geography, Department of	Chairman	D.M. Anderson	
International Affairs, School of	Director	P.E. Uren	
Law, Department of	Chairman	K.G. McShane	
Political Science, Department of	Chairman	N.H. Chi	
Psychology, Department of	Chairman	T.N. Tombaugh	
Public Administration, School of	Director	G.B. Doern	
Social Work, School of	Director	S.J. Albert	
Sociology and Anthropology, Department of	Chairman	Muni Frumhartz	
Soviet and East European Studies, Institute of	Chairman	C.H. McMillan	

Faculty of Arts, St. Patrick's College

Dean	H.A. MacDougall	
Vice-Dean	W.E. Walther	

Faculty of Science

Dean	J.L. Wolfson	
Biochemistry, Committee on	Chairman	K.W. Joy

Biology, Department of	Chairman	J.M. Neelin
Chemistry, Department of	Chairman	J.W. ApSimon
Geology, Department of	Chairman	J.M. Moore
Integrated Science Studies, Committee on	Chairman	C.H. Langford
Mathematics, Department of	Chairman	Donald Dawson
Physics, Department of	Chairman	R.L. Clarke

Faculty of Engineering

Dean M.C. de Malherbe		
Architecture, School of	Director	Douglas Shadbolt
Civil Engineering, Department of	Chairman	D.A. Kasiachuk
Electronics, Department of	Chairman	A.R. Boothroyd
Industrial Design, School of	Director	Willem Gilles
Mechanical and Aeronautical Engineering, Department of	Chairman	H.I.H. Saravanamuttoo
Systems Engineering, Department of	Chairman	D.C. Coll

Faculty of Graduate Studies and Research

Dean Gilles Paquet

Carleton University
(Incorporated without share capital under the laws of Ontario)

Balance Sheet - April 30, 1976

(with comparative figures at April 30, 1975)

Assets

	1976	1975
GENERAL FUNDS		
Temporary investments, deposit receipts	\$ 3,475,027	\$ 2,341,449
Accounts receivable	1,144,237	735,238
Inventory - bookstore, at cost	481,955	375,649
- supplies, at cost	329,300	294,632
Prepaid expenses	92,523	41,116
Faculty mortgages receivable	124,188	150,653
Receivable from plant funds	1,381,804	1,307,980
	\$ 7,029,034	\$ 5,246,717
PLANT FUNDS		
Property, plant and equipment, at cost	\$103,470,772	\$101,044,691
	\$103,470,772	\$101,044,691
ENDOWMENT AND RESTRICTED FUNDS		
Cash	\$ 365	\$ 8,225
Receivable from trustee	27,570	2,813
Accrued interest receivable	10,835	10,570
Student loans receivable	45,700	52,662
Investments held for endowed funds		
Marketable (quoted market value 1976 - \$1,309,802;		
1975 - \$1,232,160)	1,303,508	1,254,855
Other, at par value	300,000	300,000
Investments held for loan funds		
(quoted market value 1976 - \$338,071;		
1975 - \$293,425)	320,267	287,988
Receivable from current funds	2,982,262	2,856,307
	\$ 4,990,507	\$ 4,773,420

Liabilities

	1976	1975
GENERAL FUNDS		
Bank advances arising from outstanding cheques	\$ 1,000,546	\$ 739,552
Accounts payable and accrued liabilities	2,329,046	1,749,571
Deferred income	97,139	8,332
Deposits on residence accommodation	26,670	4,300
Payable to restricted funds	2,982,262	2,856,307
	6,435,663	5,358,062
Deferred net income (loss) on ancillary enterprises	152,008	(100,194)
Surplus (deficit)	441,363	(11,151)
	593,371	(111,345)
	\$ 7,029,034	\$ 5,246,717
PLANT FUNDS		
Contract payable	\$ 921,103	\$ 1,127,909
Mortgages payable	5,312,873	5,344,649
Debentures payable	53,876,119	54,003,151
Payable to current funds	1,381,804	1,307,980
	61,491,899	61,783,689
Plant funds equity	41,978,873	39,261,002
	\$103,470,772	\$101,044,691
ENDOWMENT AND RESTRICTED FUNDS		
Unexpended specific research grants	\$ 1,144,420	\$ 1,319,203
Fund balances		
Endowment funds	1,622,800	1,555,665
Loan funds	346,210	326,786
Specific purpose funds	1,877,077	1,571,766
	3,846,087	3,454,217
	\$ 4,990,507	\$ 4,773,420

Carleton University
Statement of General Income and Expenditure and Surplus
Year ended April 30, 1976 (with comparative figures for 1975)

	1976	1975
INCOME		
<i>Operating</i>		
Student academic fees	\$ 7,267,265	\$ 6,746,466
Government grants for general purpose	29,197,632	25,095,483
Miscellaneous	429,714	288,263
<i>Other</i>	36,894,611	32,130,212
Government grant for interest on debentures	3,652,214	3,697,137
Government grant for municipal taxes	433,600	415,550
Sponsored or assisted research	3,387,322	2,908,541
Transfer from specific purpose fund	753,065	629,635
	\$45,120,812	\$39,781,075
EXPENDITURE		
<i>Operating</i>		
Academic	\$25,693,240	\$22,446,569
Library	2,965,066	3,030,839
Administration	2,507,473	2,406,402
Operation and maintenance of property	4,262,643	3,542,909
Miscellaneous	1,001,612	887,237
Extraordinary	12,063	119,077
	36,442,097	32,433,033
<i>Other</i>		
Interest on debentures	3,652,214	3,697,137
Municipal taxes	433,600	415,550
Sponsored or assisted research	3,387,322	2,908,541
Student awards	753,065	629,635
	\$44,668,298	\$40,083,896
Excess of income over expenditure (expenditure over income)	\$ 452,514	\$ (302,821)
Surplus (deficit) at beginning of year	(11,151)	291,670
SURPLUS (DEFICIT) AT END OF YEAR	\$ 441,363	\$ (11,151)

Student Enrolment Comparative Summary 1974-75 and 1975-76

	1974-75	1975-76	Change	% Change
Full-time Students	8448	9120	672	8.0
Part-time Students	6034	6927	893	14.8
Summer School	5140	5665	525	10.2
Full-time Undergraduates	7679	8124	445	5.8
Part-time Undergraduates	5368	6139	771	14.4
Full-time Graduates	769	996	227	29.5
Part-time Graduates	666	788	122	18.3
Full-time Undergraduates by Degree Program:				
Bachelor of Architecture	279	287	8	2.9
Bachelor of Arts	4598	4709	111	2.4
Bachelor of Music	17	20	3	17.6
Bachelor of Journalism	482	487	5	1.0
Bachelor of Commerce	476	563	87	18.3
Bachelor of Science	1010	1059	49	4.9
Bachelor of Engineering	658	787	129	19.6
Bachelor of Industrial Design	43	71	28	65.1
Full-time Undergraduates by Year:				
Q-Year	479	490	11	2.3
I	2386	2510	124	5.2
II	1929	2075	146	7.6
III	1831	1866	35	1.9
IV and V	938	1042	104	11.1
Undergraduate Degrees and Certificates Awarded	2010	1958	(52)	(2.6)
Graduate Degrees and Diplomas Awarded	293	292	(1)	(0.3)
Undergraduate Course Enrolments	48068	51101	3033	6.3
Graduate Course Enrolments	2879	3733	854	29.7

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